# COMPENDIUM PIZZAZZ! 

## Book D

## Pjzzazz!

Gerard Romo Garrido

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Versión de este documento: 05/12/2023



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For Jennifer, Matt, Andy, and Jazz

> Cover by Nimbus Design
> Illustrations by Mark Lawler
> Technical art by Steve Reiling
> Edited by Ann Roper

0 1989, 1996 Wright Group/McGraw-Hill
One Prudential Plaza
Chicago, IL 60601
Printed in U.S.A
ISBN: 0-88488-741-3
67 •MAL•07 06

## NOTES FROM THE AUTHORS

MIDDLE SCHOOL MATH WITH PVZAZZ!
is a series of five books designed to provide practice with skills and concepts taught in today's middle school mathematics programs. The series uses many of the same puzzle formats as PRE-ALGEBRA WITH PIZZAZZ! and ALGEBRA WITH PIZZAZZ! both published by Creative Publications.

We believe that mastery of math skills and concepts requires both good teaching and a great deal of practice. Our goal is to provide puzzle activities that make this practice more meaningful and effective. To this end, we have tried to build into these activities three characteristics:

1. KNOWLEDGE OF RESULTS. Various devices are used in the puzzles to tell students whether or not their answers are correct. Feedback occurs immediately after the student works each exercise. For example, if a particular answer is not in the code or scrambled answer list, the student knows it is incorrect. He or she can then try again or ask for help. Additional feedback and reinforcement occurs when the student finds a puzzle solution that is appropriate. This immediate knowledge of results benefits students and also teachers, who no longer have to spend time confirming correct answers.

## 2. A MOTIVATING GOAL FOR THE

 STUDENT*The puzzles are designed so that students will construct a joke or unscramble the answer to a riddle in the process of checking their answers. The humor operates as an incentive, because the students are not rewarded with the punch line until they complete the exercises. While students may decry these jokes as "dumb" and groan loudly, our experience has been that they enjoy the jokes and look forward to solving the puzzles. The humor has a positive effect on class morale. In addition to humor, the variety and novelty of procedures for solving the puzzles help capture student interest. By keeping scrambled answer lists short and procedures simple, wehave tried to minimize the time spent on finding answers or doing other puzzle mechanics.
3. CAREFUL SELECTION OF TOPICS AND EXERCISES. The puzzles within each topic area are carefully sequenced so that each one builds on skills and concepts previously covered. The sequence of exercises within each puzzle is designed to guide students in incremental, step-by-step fashion toward mastery of the skill or concept involved. A primary goal is the development of problem-solving ability. In order to solve problems, students need not only rules and strategies but also a meaningful understanding of basic concepts. Some puzzles in this series are designed specifically to build concepts. Other puzzles, especially those for estimation, also help deepen students' understanding by encouraging them to look at numbers as quantities rather than just as symbols to be manipulated. For puzzles specifically keyed to problem solving, we have tried to write problems that are interesting and uncontrived. We have included extra information in some problems, and have also mixed problem types within sets, so that the problems cannot be solved mechanically.

In addition to these efforts to make the puzzles effective, we have tried to make them easy to use. The topic for each puzzle is given both at-the bottom of the puzzle page and in the Table of Contents on pages iv and v . Each puzzle is keyed to a specific topic in recent editions of leading middle school textbooks. Each puzzle requires duplicating only one page, and many of them provide space for student work. Finally, because the puzzles are selfcorrecting, they can eliminate the task of correcting assignments.

We hope that both you and your students will enjoy using these materials.

Steve and Janis Marcy

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## NOTES ABOUT USING THE PUZZLES

The selection of topics for MIDDLE SCHOOL MATH WITH PIZZAZZ! reflects recent thinking about what is important in an updated middle school math program. Virtually every puzzle can be matched with a particular lesson in recent editions of popular textbooks. After students have received instruction in a topic and worked some sample exercises, you might assign a puzzle along with a selection of textbook exercises.

Students in the middle grades should begin to classify many mathematics problems and exercises into one of three categories:

1. MENTAL MATH. Problems for which an exact answer can be obtained mentally.
2. ESTIMATION. Problems for which an approximate answer, obtained mentally, is sufficient.
3. TOOLS. Problems requiring an exact answer that cannot be obtained mentally. Students will use paper and pencil and/or calculators.

Some of the puzzles in this series focus specifically on one of these categories. A few puzzles actually present problems in all three categories and ask the student to make the classification.

By the time they reach the middle grades, students should generally be permitted to use calculators for problems that require tools (Category 3). The most common argument against calculator use is that students will become overly dependent on them. This concern, though, appears to be based primarily on fear that students will rely on the calculator for
problems in Categories 1 and 2, those that should be done mentally.

To solve problems in Category 3, calculators are wonderful tools for computing. Students may also need paper and pencil to make diagrams, write equations, record results, etc., so they will need both kinds of tools. On the other hand, students should not need calculators for problems in Categories 1 and 2, problems that call for mental math or estimation'. Skills in these areas are essential not only in daily life but also for the intelligent use of the calculator itself. The puzzles in this series reflect these three categories and the distinction between them.

When students do use calculators, you may want to have them write down whatever numbers and operations they punch in and their answers. This makes it easier to identify the cause of any error and assists in class management. Even when students do mental math or estimation puzzles, have them write a complete list of answers and, where appropriate, the process used to get the answers. Encourage students to write each answer before locating it in the answer list. Students should complete all the exercises even if they discover the answer to the joke or riddle earlier.

One advantage of using a puzzle as an assignment is that you can easily make a transparency of the page and display the exercises without having to recopy them on the board. You can then point to parts of a problem as you discuss it. It is often helpful to cut the transparency apart so that you can display exercises on part of the screen and write solutions on the remaining area.

# Other books by Steve and Janis Marcy published by Creative Publications 

Pre-Algebra With Pizzazz! in a Binder Covers most topics in a pre-algebra curriculum

Algebra With Pizzazz! in a Binder Covers most topics in a first-year algebra curriculum

## How Can You Find a Double-Decker Bus?

For each exercise, circle the letter of the more reasonable measure. Write this letter in the box containing the number of the exercise.

The chart gives an approximate size for each of the most commonly used metric units of length.

| Unit | Approximate Size |
| :--- | :--- |
| 1 millimeter $(\mathrm{rnm})$ | thickness of a dime |
| 1 centimeter $(\mathrm{cm})$ | width of your smallest finger |
| 1 meter $(\mathrm{m})$ |  |
| 1 kilometer $(\mathrm{km})$ | length of a baseball bat |
| length of 10 football fields |  |


(1) length of an ant
R 5 mm
M 5cm
(3) height of a basketball hoop
U 30m
H 3rn
(5) diameter of a quarter
G 24 cm
O 24 mm
(7) length of a tennis court
L 24 m
D 24 km
(9) thickness of a nickel

E 20 mm
02 mm
(11) length of an automobile

T 5 m
S 50 m
(13) width of a dollar bill
$\mathrm{N} 66 \mathrm{~cm} \quad \mathrm{P} 66 \mathrm{~mm}$
(15) height of a door
M 20 cm
B 2 m
(2) length of a new pencil
A 19 mm
O 19 cm
(4) distance walked in 1 hour
K 5km
B 50 m
(6) length of a paper clip
E 3cm
S 30 cm
(8) distance driven on a freeway in 1 hour
U 85 km
A 850 m
(10) height of a dining table

K $75 \mathrm{mrn} \quad \mathbf{S} 75 \mathrm{~cm}$
(12) length of a marathon race
T 400 m
F 40 km
(14) length of a sheet of typing paper
O 28 cm
R 28 mm
(16) distance from New York to Los Angeles

D 450 km T $4,500 \mathrm{~km}$

| 7 | 2 | 14 | 4 |  | 12 | 9 | 1 |  | ${ }^{11}$ | 3 | 6 |  | ${ }^{15}$ | 8 | 10 |  | 16 | 5 | 13 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

## Cryptic Quiz

1. What did the duck say to the store clerk when buying chapstick?
```
\overline{7.3}}\overline{5.4}\overline{13.6}\overline{228}\overline{232}\overline{8
```

2. Why didn't Noah catch many fish during the voyage of the ark?
```
136}\overline{0.8}\overline{15.0
```

For each exercise, measure the line segment to the nearest millimeter. Express the measurement in millimeters or centimeters, as indicated, and find your answer in the code. Each time the answer appears, write the letter of the exercise above it.

(U) length of $\overline{A B}=$ $\qquad$ cm
(Y) length of $\overline{A B}=$ $\qquad$ mm
(R) length of $\overline{B D}=$ $\qquad$ cm
(J) length of $\overline{C F}=$ $\qquad$ cm
(D) length of $\overline{A C}=$ $\qquad$ cm
(I) length of $\overline{A C}=$ $\qquad$ mm
(N) length of $\overline{B H}=\ldots \mathrm{cm}$
(M) length of $\overline{\mathrm{CH}}=$ $\qquad$ cm
(S)
length of $\overline{A E}=$ $\qquad$ cm
(E) length of $\overline{E F}=$ $\qquad$ cm
(L) length of $\overline{\mathrm{GH}}=$ $\qquad$ cm
(H)
length of $\overline{A E}=$ $\qquad$ mm
(P) length of $\overline{E F}=$
$\qquad$ mm
(B) length of $\overline{E G}=$ $\qquad$ mm
(A) length of $\overline{D G}=$ $\qquad$ mm
(W) length of $\overrightarrow{A D}=$ $\qquad$ mm
(O) length of $\overline{\boldsymbol{C G}}=$ $\qquad$ mmlength of $\overline{A H}=$
$\qquad$ mm

## Why Are Scales Like Roadmaps?

Do each exercise and find your answer in the set of answers to the right, Write the letter of the answer in the box containing the number of the exercise. If the answer has a shade in the box instead of writing a letter in it.
I. Answer each question.
(1) How many mm are in 1 cm ? $\qquad$ Answers 1-3:
(2) How many cm are in 1 m ? $\qquad$
(T) 10
(H) 100
(E) 1,000
(R) 10,000
(3) How many $m$ are in 1 km ? $\qquad$
II. Complete each statement. You are changing each measure to a smaller unit.
(4) $2.75 \mathrm{~m}=$ $\qquad$ cm

Answers 4-11:
(5) $8.3 \mathrm{~m}=$ $\qquad$ cm
(U) 3,666
(S) 27,500
(6) $41.9 \mathrm{~cm}=$ $\qquad$ mm
(R) 6,250
(E) 830
(7) $6.25 \mathrm{~cm}=$ $\qquad$ mm
(8) $1.875 \mathrm{~km}=$ $\qquad$ m
419
(K) 2.75
(9) $27.5 \mathrm{~km}=$ $\qquad$ m
(T) 40
(G) 1,875
(10) $0.4 \mathrm{~m}=$ $\qquad$ cm
(W) 275
(D) 41,900
(L) 18.75
(H) 62.5
(11) $3.666 \mathrm{~m}=$ $\qquad$ dm
36.66
(C) 4,000
III. Complete each statement. You are changing each measure to a larger unit.
(12) $12.5 \mathrm{~mm}=$ $\qquad$ cm
Answers 12-19:
(13) $94 \mathrm{~mm}=$ $\qquad$ cm
(H) 0.375
(R) 0.094
(14) $375 \mathrm{~m}=$ $\qquad$ km
(Q) 0.25
(W) 5
(15) $88 \mathrm{~m}=$ $\qquad$ km
(P) 500
(O) 1.25
(16) $643 \mathrm{~cm}=\ldots \mathrm{m}$
6.43
(E) 0.088
(H) 2.5
(Y) 9.4
(U) 0.0643
(A) 8.8
(I) 0.025
(17) $2.5 \mathrm{~cm}=$ $\qquad$ m
(18) $250 \mathrm{~mm}=$ $\qquad$ dm
(19) $5,000 \mathrm{~m}=$ $\qquad$ km




| 62 | $8 乙$ | $\angle 2$ | 92 | SZ | †乙 | $\varepsilon 乙$ | 乙乙 | 12 | 02 | 61 | 81 | $\angle 1$ | 91 | St | 七1 | $\varepsilon 1$ | 21 | 11 | 01 | 6 | 8 | $L$ | 9 | G | † | $\varepsilon$ | Z | 1 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |

## What Did the Finger Say to the Thumb?

Choose the correct answer for each exercise. Write the letter of the answer in the box containing the number of the exercise. The table below may help you.

| Unit | Approximate Size |
| :--- | :--- |
| $\mathbf{1}$ milliliter ( mL ) | capacity of an eyedropper <br> $\mathbf{1}$ liter (L) <br> 1 kiloliter ( kL ) |
| capacity of a juice carton |  |
| capacity of $\mathbf{4}$ bathtubs |  |

I. Choose the more reasonable estimate of capacity.
(1) a pot for cooking
(2) a tablespoon
(3) an automobile gas tank
C $15 \mathrm{~L} \quad$ I 15 mL
N $50 \mathrm{~L} \quad$ P 5 kL
(4) a swimming pool
(5) a drinking glass
6) a water cooler jug
025 mL M 250 mL H 20L R 2L
II. Complete each statement. Answers 7-14:
(7) $8.5 \mathrm{~L}=$ $\qquad$ mL
B 25
Y 90
(8) $0.4 \mathrm{~L}=$ $\qquad$ mL
U 1,750
W 40,000
(9) $90,000 \mathrm{~mL}=$ $\qquad$ L
O 8,500 F 32
(10) $250 \mathrm{~mL}=$ $\qquad$ L
D 4,000 I 0.75
(11) $1.75 \mathrm{~kL}=$ $\qquad$ L
S 900
R 175
(12) $40 \mathrm{~kL}=$ $\qquad$ L
G 0.25
I 400
(13) $750 \mathrm{~L}=$ $\qquad$ kL
T 3.2
U 7.5
(14) $3,200 \mathrm{~L}=$ $\qquad$ kL
III. Solve.

Answers 15-16:
(15) Ms. Sparkle bought 12 cans of diet soda. Each can contained 350 mL . How many liters of soda did she buy?

R 48 V 4.2
(16) Chef Pierre made 6.4 L of creamed carrot soup. If it is

L 32
N 5.4 served in $200-\mathrm{mL}$ cups, how many cups can be filled?

| 8 | 5 |  | 13 | 3 |  | 10 | 16 | 7 | 15 | 1 |  | 12 | 2 | 14 | 6 |  | 9 | 4 | 11 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

MIDDLE SCHOOL MATH WITH PIZZAZZ! BOOK D © Creative Publications

D-11
TOPIC 1-d: Capacity

## What Do Salmon and Cod Use When They Go to War?

Choose the correct answer for each exercise. Find the letter of the answer in the string of letters near the bottom of the page and CROSS IT OUT each time it appears. When you finish, write the remaining letters in the rectangle at the bottom of the page. The table below may help you.


| Unit | Approximate Size |
| :--- | :--- |
| 1 milligram ( mg ) <br> 1 gram (g) <br> 1 kilogram (kg) | mass (weight) of a grain of sand <br> mass (weight) of a paperclip <br> mass (weight) of a math textbook |


I. Choose the more reasonable estimate of weight.
(1) a nickel
(2) a postage stamp
(3) a bowling ball
(A) 60 g
(Y) 60 mg
(5) a 12-year-old child
(Z) 40 kg (I) 4 kg
(X) 12 g (W) 120 g
(B) 7 kg (K 70 kg
(6) a postcard
(Q) 75 g (G) 750 mg
II. Complete each statement.
(7) $6.5 \mathrm{~g}=$ $\qquad$ mg
(8) $0.8 \mathrm{~g}=$ $\qquad$ mg
(9) $4,900 \mathrm{mg}=$ $\qquad$ g
(10) $133 \mathrm{mg}=$ $\qquad$ $g$
(11) $7.25 \mathrm{~kg}=$ $\qquad$ g
(12) $60 \mathrm{~kg}=$ $\qquad$ $g$
(13) $250 \mathrm{~g}=$ $\qquad$ kg
(14) $80,000 \mathrm{~g}=$ $\qquad$ kg

## Answers 7-14:

(H) 490
(L) 0.133
(J) 800
(C) 60,000
(T) 725
(v) 6,500
(F) 2.5
(K) 13.3
(P) 4.9
(U) 7,250
(S) 0.6
(D) 80
(E) 0.25
(I) 65
III. Solve.
(15) An average orange weighs 270 g . How many kilograms does a bag of 8 oranges weigh?
(16) A vitamin tablet weighs 1.2 g . It contains 150 mg of Vitamin C and 250 mg of B Complex vitamins. How many milligrams of other ingredients are in the tablet?
(F) 920
(T) 1.96
(O) 800
(R) 2.16

Answers 15-16:

B R Y L FEGOIPMCSODHWTRBGALONZUKVESJ
Answer to puzzle:


| Ш | 14 min 30 s |
| :---: | :---: |
| $\omega$ | 1; 55 |
| $\simeq$ | 15 min 26 s |
| צ | 3 d 15 h |
| $>$ | 420 |
| z | 3 min 28 s |
| $\bigcirc$ | 6 h 28 min |
| $\infty$ | 3 |
| 3 | 6 h 15 min |
| エ | 4 min 40 s |
| 0 | 3,920 |
| 0 | 72 |
| 0 | 240 |
| ш | 2d17 h |
| $\infty$ | 3 min 42 s |
| $\checkmark$ | 1; 20 |
| $\times$ | 12 h 28 min |
| < | 9 h 51 min |
| $\vdash$ | 310 |
| Z | 12 h 42 min |
| Ш | 14 min 56 s |
| $\square$ | 9 |
| $\bigcirc$ | 4,320 |
| $\Perp$ | 11 h |
| $\vdash$ | 10 h 58 min |
| エ | 150 |
| $\cdots$ | 6 h 40 min |
| < | 2; 15 |

(14) $\begin{array}{r}8 \min 10 \mathrm{~s} \\ -3 \mathrm{~min} 30 \mathrm{~s}\end{array}$
(15) 12 h 25 min
$-5 \mathrm{~h} 45 \mathrm{~min}$
(18) 9 min
$-5 \min 32 \mathrm{~s}$
(19) $-2 d 14 h$
(17) 6 h 47 min +4 h 13 min
(16) 32 min 50 s
$-17 \mathrm{~min} 24 \mathrm{~s}$
$-3 \min 30 \mathrm{~s}$
III. Solve.
(20) It takes 15 h 20 min to travel from Los Angeles to Salt Lake City by train. It takes only 2 h 38 min to fly between the two cities. How much longer does the train take?
(12) 5 min 40 s
(13) 7 h 8 min $+8 \min 50 \mathrm{~s}$ $+2 \mathrm{~h} 43 \mathrm{~min}$
(11) 2 h 30 min
+3 h 45 min

## What Has Four Legs and Flies?

This title question has TWO different answers. Part I gives you one answer and Part II gives you the other. Follow the directions for each part.
I. Identify each measurement that is marked with a letter. Write each letter in the box that contains the corresponding measurement.


| $2 \frac{5}{8}$ in. | $5 \frac{1}{2}$ in. | $5 \frac{7}{8}$ in. | $\frac{1}{8}$ in. | $4 \frac{3}{4}$ in. | $7 \frac{1}{8}$ in. | $3 \frac{3}{8}$ in. | $2 \frac{1}{4}$ in. | $6 \frac{3}{4}$ in. | $5 \frac{3}{8}$ in. | $\frac{3}{4}$ in. $6 \frac{1}{2}$ in. | $1 \frac{1}{2}$ in. | $3 \frac{7}{8}$ in. |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

II. For each exercise, measure the line segment to the nearest $\frac{1}{8}$ inch. Write the letter of the exercise in the box containing the measurement.

(O) $\overline{A B}$ $\qquad$ in.
(A) $\overline{A C}$ $\qquad$ in.
(S) $\overline{A D}$ $\qquad$ in.
(W) $\bar{A} \bar{E}$ $\qquad$ in.
(1) $\overline{A F}$ $\qquad$ in.
(A) $\overline{A G}$ $\qquad$ in.
(S) $\overline{A H}$ $\qquad$ in.
(T) $\overline{A I}$ $\qquad$ in.
(O) $\overline{B G}$ $\qquad$ in.
(F) $\overline{B H}$ $\qquad$ in.
(T) $\overline{D G}$
(P) $\overline{D H}$ $\qquad$ in.
(R) $\overline{F G}$ $\qquad$ in.
(N) $\overline{F I}$ $\qquad$ in.
(P) $\bar{H}$ $\qquad$ in.

| $3 \frac{1}{4}$ | $4 \frac{7}{8}$ | $5 \frac{1}{2}$ | $3 \frac{5}{8}$ | $\frac{3}{8}$ | $2 \frac{3}{8}$ | $6 \frac{1}{8}$ | $\frac{5}{8}$ | $8 \frac{5}{8}$ | $5 \frac{1}{4}$ | $1 \frac{1}{4}$ | $7 \frac{3}{8}$ | $\frac{1}{2}$ | $5 \frac{1}{8}$ | $6 \frac{3}{4}$ | $2 \frac{7}{8}$ | 9 | $3 \frac{1}{2}$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

## Why Do Elephants Lift Weights?

Measure each line segment below to the nearest one-eighth inch. Find your answer in the answer column. Write the letter of the exercise in the box containing the number of the answer.
(E)

(T)

(R)

(H)

(E)

(I)
(T)
(A)
(E)

(I)
(R)
(O)

(T)
(X)
(E)
(2)
(G)
(T)
(S)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

(1) $3 \frac{7}{8} \mathrm{in}$.
(2) $2 \frac{7}{8} \mathrm{in}$.
(3) $\frac{7}{8} \mathrm{in}$.
(4) $5 \frac{1}{4}$ in.
(5) $4 \frac{1}{4}$ in.
(6) $4 \frac{3}{8} \mathrm{in}$.
(7) $3 \frac{1}{8}$ in.
(8) $5 \frac{1}{8} \mathrm{in}$.
(9) $3 \frac{5}{8} \mathrm{in}$.
(10) $\frac{3}{4} \mathrm{in}$.
(11) $2 \frac{1}{2} \mathrm{in}$.
(12) $1 \frac{5}{8} \mathrm{in}$.
(13) $1 \frac{3}{8} \mathrm{in}$.
(14) $1 \frac{3}{4} \mathrm{in}$.
(15) $4 \frac{1}{2} \mathrm{in}$.
(16) $2 \frac{5}{8} \mathrm{in}$.
(17) 2 in .
(18) $4 \frac{3}{4} \mathrm{in}$.
(19) $3 \frac{3}{8} \mathrm{in}$.

## Meqsure with Dleasure

Follow the directions below. When you complete each step, put an $\times$ in front of it. Measure carefully and you will get the picture!
_ 1. Copy rectangle ABCD on another sheet of paper. The rectangle is 7 in. wide and $9 \frac{1}{2}$ in. high.
__ 2. Place your ruler on $\overline{A B}$. Measure $3 \frac{1}{8}$ in. across from Point $A$. Make a dot to mark this point. Label it Point E
_ 3. Place your ruler on $\overline{B C}$. Measure down $1 \frac{1}{4}$ in. from Point $B$. Make a dot to mark this point. Label it Point $F$.
_ 4. On $\overline{B C}$, measure down $5 \frac{7}{8}$ in. from $B$. Label this Point $G$
—_ 5. Point His on $\overline{B C}, 7 \frac{3}{8}$ in. from $B$.
_ 6. Point $/$ is on $\overline{B C}, 8 \frac{3}{8}$ in. from $B$.
__ 7. Point $J$ is on $\overline{A D}, 7$ in. from A. Connect points Hand $J$.
$\qquad$ 8. Point $K$ is on $\overline{A D}, 8 \frac{1}{2}$ in. from A. Connect points Iand $K$.
_ 9. Point $L$ is on $\overline{J H}, 3 \frac{1}{8}$ in. from J. Draw $\overline{E L}$.
_10. Point $M$ is on $\overline{E L,}, \frac{7}{8}$ in. from E Draw GM.
_11. Point $N$ is on $\overline{A D}, 5 \frac{3}{4}$ in. from A. Draw $\overline{M N}$.
_12. Line up your ruler on Points E and F. Mark a point 1 in. from E and label it Point $O$. Connect points E and $O$.
_13. Point Pis on $\overline{E L}, \frac{5}{8}$ in. from E Draw $\overline{\mathrm{OP}}$.
_14. Point $Q$ is on $\overline{E L}, 6 \frac{1}{4}$ in. from $E$. Draw $\overline{G Q}$.
_15. Point $R$ is on $\overline{E L}, 6 \frac{5}{8}$ in. from E Draw $\overline{N R}$.
$\qquad$ 16. Point $S$ is on $\overline{N R}, 2 \frac{3}{4}$ in. from $N$ Draw $\overline{M S}$.
_17. Point Tis on $\overline{K l,} 1 \frac{1}{8}$ in. from $K$. Draw $\overline{J T}$.
__18. Point $U$ is on $\overline{K I}, 6$ in. from $K$. Draw $\overline{H U}$.

## What Is the Title?

## TO FIND THE TITLE OF THIS PICTURE:

Do each exercise below. Find your answer in the code and write the letter of the exercise above it. (Each answer appears only once.)

## CODED TITLE:



| 72 | $\overline{1 ; 20}$ | 5;9 | 11;2 | 3 | 15 | 98 | 4 | 3;1 | 18 | 12 | 61 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 8;16 | 24 | 7 | 5 | 29 | 126 | 36 | 10;6 | 60 | 1;7 | 8 | 100 |

I. Answer each question.
(N) How many inches are in 1 foot? $\qquad$
(E) How many feet are in 1 yard?
$\qquad$
(D) How many inches are in 1 yard?
$\qquad$
II. Complete each statement.

You are changing each measure to a smaller unit.
(A) $2 \mathrm{ft}=$ $\qquad$ in.
(T) $5 \mathrm{ft}=$ $\qquad$ in.
(1) $1 \mathrm{ft} 6 \mathrm{in} .=$ $\qquad$ in.
(D) $8 \mathrm{ft} 4 \mathrm{in} .=$ $\qquad$ in.
(B) $5 \mathrm{yd}=$ $\qquad$ ft
(A) $9 \mathrm{yd} 2 \mathrm{ft}=$ $\qquad$ ft
(G) $20 \mathrm{yd} 1 \mathrm{ft}=$ $\qquad$ ft
(S) $2 \mathrm{yd}=$ $\qquad$ in.
(N) 3 yd 18 in. $=$ $\qquad$ in.

## What Did Airhead Klutz Look For When H e First Took U p Waterskiing?

Find each answer in the set of boxes under the exercise. Write the letter of the exercise in the space above the answer.
I. Complete each statement.
(I) $7 \mathrm{ft}=$ $\qquad$ in.
(C) $4 \mathrm{ft} 10 \mathrm{in}=\ldots$ in in.
(A) 10 ft 3 in. $=$ $\qquad$ in.
(T) $8 \mathrm{yd}=$ $\qquad$ ft
(E) $5 \mathrm{yd} 2 \mathrm{ft}=$ $\qquad$ ft
(I) $4 \mathrm{yd}=$ $\qquad$ in.
(W) $60 \mathrm{in} .=$ $\qquad$ ft
(A) $40 \mathrm{in} .=$ $\qquad$ ft
$\qquad$ in. (E) 72 in. $=$ $\qquad$ yd
(H) $2 \frac{1}{2} \mathrm{ft}=$
$\qquad$ in.
(L) $7 \frac{2}{3} \mathrm{yd}=$ $\qquad$ ft
(N) $100 \mathrm{ft}=\ldots \mathrm{yd}$ $\qquad$ ft
(K) A baseball diamond is a square with 90 feet between bases. About how many yards does a player run after hitting a home run? yd

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $3 ; 4$ | 28 | $33 ; 1$ | 144 | 58 | 2 | 140 | 23 | 123 | 120 | 17 | $9 ; 1$ | 5 | 84 | 24 | 30 |

II. Add or subtract. Simplify if possible.
(G) $\begin{aligned} & 3 \mathrm{ft} 7 \mathrm{in} . \\ + & 2 \mathrm{ft} 8 \mathrm{in} .\end{aligned}$
(I) 5 ft 9 in .
(L) 13 ft 2 in .
+6 ft 8 in .
(N) $3 y d 2 f t$ +8 ft 10 in .
(I) 7 ft 4 in .
$-2 \mathrm{ft} 7 \mathrm{in}$.
(T) 10 ft 8 in .
(I) 14 yd 1 ft - 8 yd 2 ft
(L) 12 ft 6 in . +7 ft 6 in.
(B) 20 ft - 5 ft 8 in .
(1) 9 yd 2 ft
(H) 36 yd $+6 \mathrm{yd} 1 \mathrm{ft}$ $\begin{array}{r}-28 \mathrm{yd} 1 \mathrm{ft} \\ \hline\end{array}$


## Why Did the Young Actress Stuff Her Autograph Into Bottles of that Low-Calorie Cola?



Find each answer in the appropriate set of boxes at the bottom of the page. Write the letter of the exercise in the box containing the answer.
I. Complete each statement. You are changing each measure to a smaller unit.
(E) $5 \mathrm{gal}=$ $\qquad$ qt
(T) $9 \mathrm{gal}=$ $\qquad$ qt
(0) $2 \mathrm{qt}=$ $\qquad$ pt
(A) $15 \mathrm{qt}=$ $\qquad$ pt
(E) $1 \mathrm{pt}=$ $\qquad$ c
(D) $7 \mathrm{pt}=$ $\qquad$ C
(S) $3 \mathrm{c}=$ $\qquad$ fl oz
(T) $10 \mathrm{c}=$ $\qquad$ fl oz
(E) $1 \mathrm{gal} 2 \mathrm{qt}=$ $\qquad$ qt
(S) $6 \mathrm{gal} 3 \mathrm{qt}=$ $\qquad$ qt
(W) $4 \mathrm{pt} 1 \mathrm{c}=$ $\qquad$ c
(H) $1 \mathrm{gal}=$ $\qquad$ pt
(E) $1 \mathrm{pt}=$ $\qquad$ fl OZ
(N) $1 \mathrm{qt}=$ $\qquad$ fl OZ
II. Complete each statement. You are changing each measure to a larger unit.
(N) $12 \mathrm{qt}=$ $\qquad$ gal
(E) $40 \mathrm{qt}=$ $\qquad$ gal
(S) $8 \mathrm{pt}=$ $\qquad$
(A) $24 \mathrm{pt}=$ $\qquad$ qt
(1) $10 \mathrm{c}=$ $\qquad$ pt
(R) $18 \mathrm{c}=$ $\qquad$ pt
(E) $16 \mathrm{fl} \mathrm{oz}=$ $\qquad$ c
(M) $64 \mathrm{fl} \mathrm{OZ}=$ $\qquad$ c
(I) $7 \mathrm{qt}=$ $\qquad$ gal $\qquad$ qt
(H) $30 \mathrm{qt}=$ $\qquad$ gal $\qquad$ qt
(E) $9 \mathrm{pt}=$ $\qquad$ qt $\qquad$ pt
(L) $25 \mathrm{c}=$ $\qquad$ pt $\qquad$ c
(N) $12 \mathrm{fl} \mathrm{oz}=$ $\qquad$ c $\qquad$ fl OZ
(T) $50 \mathrm{fl} \mathrm{oz}=$ $\qquad$ c $\qquad$ fl oz

Answers for Column I

| 24 | 8 | 20 | 15 | 9 | 30 | 32 | 36 | 6 | 14 | 12 | 80 | 4 | 48 | 27 | 16 | 2 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

Answers for Column II

| $7 ; 2$ | 10 | 9 | 14 | $1 ; 4$ | 12 | 8 | $4 ; 1$ | 7 | $1 ; 3$ | 3 | $8 ; 1$ | $12 ; 1$ | 5 | $6 ; 2$ | 2 | 4 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |

## Did You Hear About...



Answers A - L:


Do each exercise and find your answer in the appropriate answer column. Notice the word next to the answer. Write this word in the box containing the letter of the exercise.
I. Complete each statement.
(A) $3 \mathrm{gal}=\ldots \quad \mathrm{qt}$
(B) $8 \mathrm{pt}=$ $\qquad$ c
(C) $5 \mathrm{qt}=\ldots \mathrm{pt}$
(D) $6 \mathrm{c}=$ $\qquad$ fl oz
(E) $\frac{1}{2} \mathrm{gal}=$
qt
(F) $2 \frac{1}{2} p t=$ $\qquad$ c
(G) $1 \mathrm{qt}=$ $\qquad$ c
(H) $1 \mathrm{qt}=$ $\qquad$ fl oz
(I) $4 \mathrm{gal} 3 \mathrm{qt}=$ $\qquad$ qt
(J) $7 \mathrm{qt}=$ $\qquad$ pt
(K) $7 \mathrm{qt}=$ $\qquad$ c
(L) $7 \mathrm{qt}=$ $\qquad$ fl oz
(M) $20 \mathrm{qt}=$ $\qquad$ (N) $12 \mathrm{pt}=$ $\qquad$ $q t$
(O) $16 \mathrm{fl} \mathrm{oz}=$ $\qquad$ c
(P) $36 \mathrm{c}=$ $\qquad$ pt
(Q) $8 \mathrm{pt}=$ $\qquad$ gal
(R) $9 \mathrm{qt}=$ $\qquad$ gal $\qquad$ qt
(S) $48 \mathrm{fl} \mathrm{oz}=$ $\qquad$ pt
(T) $60 \mathrm{c}=$ $\qquad$ $q t$
(U) $100 \mathrm{fl} \mathrm{oz}=$ $\qquad$ c floz II. Solve.
(v)

Mr. Fizz bought 6 cans of root beer. Each can contained 12 fl oz . How many cups of root beer did he buy?
(W) A certain paint is sold in both 1 -gal cans and $1-\mathrm{qt}$ cans. The gallon can costs $\$ 13$ and the quart can costs $\$ 5$. How much do you save per gallon by buying the larger cans?
(X) Mrs. Ramirez bought 2 qt of orange juice. If the juice is served in $6-0 z$ glasses, how many glasses can be completely filled?

Answers M - X:

|  | ONLY |
| :---: | :---: |
| 2;1 THEN |  |
|  | 6 LEFT |
| 12;4 THE |  |
| 13 GOING |  |
| 1 RIGHT |  |
| 15 IS |  |
| 7 WAY |  |
|  | 5 IF |
|  | 2 IS |
| 10 LEFT |  |
|  | 9;6 A |
| 3 RIGHT |  |
| 18 NOT |  |

## What Did They Call the Guy Who Made 367 Mistakes While Typing One Page?

Cross out the box containing each correct answer. When you finish, write the letters from the remaining boxes in the spaces at the bottom of the page.
I. Complete each statement.
(1) $5 \mathrm{lb}=$ $\qquad$ oz
(3) $3 \mathrm{lb} 80 \mathrm{oz}=$ $\qquad$ oz
(5) $\frac{1}{2} \mathrm{lb}=$ $\qquad$ oz
(7) $1 \mathrm{~T} 700 \mathrm{lb}=$ $\qquad$ lb
(9) $48 \mathrm{oz}=$ $\qquad$ lb
(11) $100 \mathrm{oz}=$ $\qquad$ lb $\qquad$ oz
(13) $5,600 \mathrm{lb}=$ $\qquad$ T $\qquad$ lb
II. Solve.
(15) How many ounces of meat are used to make a $\frac{1}{4}$-lb hamburger? $\qquad$ oz
(16) One dozen baseballs were packaged for mailing. Each ball weighed 5 oz and the box weighed 9 oz . Find the total weight of the package in pounds and ounces. lb $\qquad$ oz
(2) $2 \mathrm{lb} 12 \mathrm{oz}=\ldots \quad \mathrm{oz}$
(4) $10 \mathrm{lb} 30 z=$ $\qquad$ oz
(6) $3 T=$ $\qquad$ lb
(8) $4 \frac{1}{2} \mathrm{~T}=$ $\qquad$ lb
(10) $420 z=$ $\qquad$ lb $\qquad$ oz
(12) $10,000 \mathrm{lb}=$ $\qquad$ T
(14) $1 T=$ $\qquad$ oz
(17) There are 30 students in a math class with an average weight of 92 lb per student.
A. What is the combined weight of all the students in the class? $\qquad$ lb
B. How much more than a ton is this? lb

| TH | AT | OP | EB | AD | TR | YP | OT |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $4 ; 5$ | 7 | $2 ; 10$ | 44 | 6,000 | 760 | 2,400 | $2 ; 1,600$ |
| LO | GR | EW | IT | ON | TO | ST | RO |
| 163 | 4 | $7 ; 2$ | 9,000 | $6 ; 4$ | 80 | 2,760 | 400 |
| SO | NG | BE | PA | GE | ER | EN | UP |
| 3 | $3 ; 800$ | 32,000 | 56 | 8 | 28,000 | 5 | 2,700 |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |



$$
\begin{aligned}
& \text { hy Couldn't the Astronaut Make Cinnamon Toast? } \\
& \text { Do each exercise and find your answer in the set of answers to the right. Write } \\
& \text { the letter of the answer in each box containing the number of the exercise. If } \\
& \text { the answer has a } \quad \text {, shade in each box containing that exercise number. }
\end{aligned}
$$



$$
\begin{aligned}
& \text { (12) Linda Kuerth set a record by eating } 23 \\
& \text { frankfurters in } 3 \text { min } 10 \mathrm{~s} \text {. If each }
\end{aligned}
$$

Answers 11-16:

$$
000 \times 009 \text { (8) N }
$$

$$
\begin{aligned}
& \infty \\
& \infty
\end{aligned}
$$

$$
\frac{\forall}{\dot{i}}
$$

$$
\underset{\sim}{\sim}
$$

$$
\begin{array}{ll}
8 & \\
8 \\
8 & 0 \\
\infty & 0
\end{array}
$$

$$
0
$$

O
©
(a)

$$
\begin{aligned}
& \text { 읐 } \\
& (1)
\end{aligned}
$$

\[

\]

$$
\text { (D) } 150
$$

$$
\text { (F) } 2.80
$$

| 8 | 15 | 13 | 11 | 6 | 2 | 13 | 14 | 12 | 3 | 16 | 9 | 15 | 5 | 15 | 9 | 1 | 13 | 12 | 10 | 5 | 15 | 7 | 13 | 2 | 16 | 4 | 14 | 15 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

## What JobDoes the Buttermilk Biscuit Have in the Movie?

Do each exercise and find your answer in the appropriate answer box. Write the letter of the answer in the box containing the number of the exercise.
(2) 9 min 20 s
(3) $\begin{array}{r}7 \mathrm{~h} 10 \mathrm{~min} \\ -\quad 2 \mathrm{~h} 50 \mathrm{~min}\end{array}$
(4) 8 min $+4 \mathrm{~min} 10 \mathrm{~s}$
$-5 \min 25 s$
(5)
$+6 \mathrm{ft} 4 \mathrm{in}$.
(6) +3 fit 8 in.
(7) $\begin{array}{r}12 \text { yd }_{2} f t \\ +\end{array}$
(8) $-50 y^{2} 1 \mathrm{ft}$
(9) 1 c 2 fl oz
$+2 \mathrm{c} 5 \mathrm{floz}$
(10) $\begin{array}{r}7 \mathrm{gal} 3 \mathrm{qt} \\ +6 \mathrm{gal} 3 \mathrm{qt} \\ \hline\end{array}$
(11) 3 qt I pt
(12) 20 gal
$+5 \mathrm{qt} 1 \mathrm{pt}$
$-\quad 4 \mathrm{gal} 1 \mathrm{qt}$
(13)

8 lb 9 oz
$+30 \mathrm{lb} 9 \mathrm{oz}$
(14) 9 lb
$-2 \mathrm{lb} 10 \mathrm{oz}$
(15) $4 T 1,500 \mathrm{lb}$
(16) $6 \mathrm{lb} \quad 8 \mathrm{oz}$ $-5 \mathrm{lb} 12 \mathrm{oz}$
(17) To power an experimental car, Willy Messerschmitt mixed 12 gal 3 qt of gasoline with 4 gal 2 qt of ethyl alcohol. How much fuel did this make?
(18) The average 12 -year-old in the U.S. weighs 85 lb 12 oz . The average 14-year-old weighs 108 lb 2 oz . How much weight does the average person gain during these two years?


## What Does a Cat Need to Play Baseball?

For each exercise, circle the letter of the correct choice. Write this letter in the box containing the number of the exercise.

(1) Which of the following is not a point on $\overline{A t}$ ?
(Y) $B$
(R) $D$
(V) $A$
(2) Which of the following is not a correct name for this line?
(A) $\overrightarrow{P Q}$
(L) $\overleftrightarrow{Q P}$
(G) $\overleftrightarrow{P Q}$

(3) Which of the following is not the name of a segment in this figure?
(O) $\overline{R S}$
(T) $\overleftrightarrow{S T}$
(H) $\overline{T R}$
(4) Which of the following is not the name of a ray in this figure?
(W) $\overrightarrow{E G}$
(S) $\overrightarrow{F G}$
(U) $\overrightarrow{F E}$
(5) Which of the following is not a correct name for this angle?
(1) $\angle A C B$
(Y) $\angle C B A$
(L) $\angle B$
(6) Which of the following is not the name of a line in this figure?
(G) $\overleftrightarrow{z x}$
(R) $\overleftrightarrow{X Y}$
(K) $\overleftrightarrow{Y Z}$
(7) Which of the following is a segment that has $B$ as an endpoint?
(N) $\overline{C D}$
(C) $\overline{A C}$
(T) $\overline{C B}$
(8) Which of the following is not the name of a ray in this figure?
(H) $\overrightarrow{M O}$
(S) $\overrightarrow{L M}$
(P) $\overrightarrow{K O}$
(9) Which of the following is not a correct name for an angle in this figure?
(M) $\angle H$
(A) LGHF
(D) $\angle E H G$

## What Did Mrs. Claws Say During the Thunderstorm?

Find each answer at the bottom of the page and write the letter of the exercise above it.
I. Complete each statement.

(T) The figure formed by two rays from the same endpoint is an $\qquad$
(O) The intersection of the two sides of an angle is called its $\qquad$
(I) The vertex of $\angle C O D$ in the drawing above is point $\qquad$
(A) The instrument used to measure angles is called a $\qquad$
(E) The basic unit in which angles are measured is the $\qquad$
(O) $\angle A O B$ has a measure of $90^{\circ}$ and is called a $\qquad$ angle.
(A) An angle whose measure is between $0^{\circ}$ and $90^{\circ}$ is an $\qquad$ angle.
(T) Two acute angles in the figure are $\angle B O C$ and $\qquad$
(L) An angle whose measure is between $90^{\prime \prime}$ and $180^{\circ}$ is an $\qquad$ angle.
(N) An obtuse angle in the figure is $\qquad$
II. Give the measure of each angle.
(A) $\angle R Q S$ $\qquad$
(T) $L R Q T$ $\qquad$
(R) $\angle R Q U$ $\qquad$
(H) $\angle R Q V$ $\qquad$
(A) $L R Q W$ $\qquad$
(K) $L X Q W$ $\qquad$
(D) $L X Q T$ $\qquad$
(R) $\angle U Q V$ $\qquad$


## Why Did the Brontosaurus Need Band-Aids?

For each exercise, circle the letter of the best estimate. Write this letter in the box containing the number of the exercise.

(2) $m \angle X$ is about
$\mathrm{T} 65^{\circ} \quad 030^{\circ}$

(5) $m \angle K$ is about
$050^{\circ} \quad F 80^{\circ}$
$125^{\circ}$
L $55^{\circ}$

(10) $m \angle P O R$ is about

M $160^{\circ} \quad$ F $120^{\circ}$
(11) $m \angle P O Q$ is about
$\vee 40^{\circ} \quad \mathrm{N} 15^{\circ}$
(12) $m \angle Q O R$ is about

R $105^{\circ}$
B $140^{\circ}$

(13) $m \angle X$ is about P $35^{\circ} \quad \mathrm{H} 60^{\circ}$
(14) $m \angle Y$ is about
S $45^{\circ}$
L $25^{\circ}$
(15) $m \angle Z$ is about

D $75^{\circ} \quad$ G $40^{\circ}$

| 10 | 2 | 6 | 13 | 8 | 1 | 15 | 4 | 11 | 9 | 14 | 5 | 12 | 3 | 7 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

## Books Never Written

Beginning Your Exercise Programby

$$
57^{\circ} \quad 99^{\circ} \quad 119^{\circ}
$$

$137^{\circ} 173^{\circ} 85^{\circ} 99^{\circ} 33^{\circ}$
Checking Your Homework by

$$
33^{\circ} \quad 76^{\circ}
$$

$$
156^{\circ} 33^{\circ} 47^{\circ} 125^{\circ} 28^{\circ} \quad 14^{\circ}
$$

How to Lead the Bandby

$$
38^{\circ} 62^{\circ} 33^{\circ} 90^{\circ} \quad 28^{\circ} 62^{\circ}
$$

$$
41^{\circ} 173^{\circ} 119^{\circ} 125^{\circ}
$$

ABOVE ARE THE TITLES OF THREE "BOOKS NEVER WRITTEN." TO DECODE THE NAMES OF THEIR AUTHORS:
Measure each angle below and find your answer in the code. Each time the answer appears in the code, write the vertex letter of that angle above it.


What Happens When Cupid Shoots an Arrow?
Use a protractor to construct the angles below. Each side you draw will pass through a number. Write the vertex letter of the angle in the box containing this number.
(8)
(14) (1)
(9)
(12)

(11)
(4)
(5)

(3)
(6) (4)
(2)
(14)
(13)
(8)
(7)
(6)

(2)
(13)
(7)
(12)

(3)
(3)
(5)
(10)


yt | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

# Why Is a Party Like Pouring Oil Into a Car? 

Do each exercise and find your answer at the bottom of the page. Write the letter of the exercise in the box above or below the answer.
I. Find the measure of the angle that is complementary to the angle having the measure given.
(E) $20^{\circ}$
(H) $67^{\circ}$
(S) $14^{\circ}$
(E) $81^{\circ}$
(T) $45^{\circ}$
II. Find the measure of the angle that is supplementary to the angle having the measure given.
(R) $120^{\circ}$
(E) $56^{\circ}$
(I) $29^{\circ}$
(U) $162^{\circ}$
(H) $83^{\circ}$
III. Find the angle measure that is not given.


TOPIC 3-f: Complementary and Supplementary Angles

## How Did the Judge Find Out About the Rotten Milk?

Do each exercise and find your answer in the Code Key. Notice the letter next to the answer. Write this letter in the box containing the number for the exercise.
I. Complete each statement.
(1) Two angles are complementary if the sum of their measures is $\qquad$
(2) Two angles are supplementaryif the sum of their measures is $\qquad$
(3) The complement of a $30^{\circ}$ angle has a measure of $\qquad$ -.
(4) The supplementof a $65^{\circ}$ angle has a measure of $\qquad$

II. Find the measureof each numbered angle.


| CODE <br> KEY |  |
| :---: | :---: |
| $23^{\circ}$ | D |
| $30^{\circ}$ | Q |
| $36^{\circ}$ | T |
| $52^{\circ}$ | A |
| $60^{\circ}$ | R |
| $65^{\circ}$ | U |
| $80^{\circ}$ | I |
| $90^{\circ}$ | O |
| $100^{\circ}$ | H |
| $107^{\circ}$ | S |
| $115^{\circ}$ | E |
| $144^{\circ}$ | W |
| $180^{\circ}$ | N |



## What Is The Biggest Prablem of Miners?

Circle the number-letter pair of each TRUE statement. For these pairs, write the letter in the matching numbered box at the right.
I. Use the figure below, in which $\mathbb{F} \mid \overline{B H}$ You should find 11 true statements.
7-E $\overleftrightarrow{E F}$ intersects $\overleftrightarrow{A D}$ at $C$.
11-O $\overleftrightarrow{E B} \perp \overleftrightarrow{A C}$
2-H $\stackrel{\leftrightarrow}{F C} \| \overleftrightarrow{H G}$
17-E $\overleftrightarrow{H C} \perp \overleftrightarrow{D B}$
1-T $\overleftrightarrow{E B} \| \overleftrightarrow{C H}$
3-A $\overleftrightarrow{B G} \perp \overleftrightarrow{C H}$
16-S $\overleftrightarrow{C F} \| \overleftrightarrow{B E}$
suoupengand enlueadO @
a yooa iZZVZZId HIIM HIVW רOOHOS ヨาaaiw
12-A $\angle E B C$ is a right angle.
18-G $L D C E$ is a right angle.
3-E $m \angle H C B=90^{\circ}$.
8-T $\angle \mathrm{FCH}$ is an acute angle.


16-E LECH is an obtuse angle.
14-P $\angle A B E$ is an acute angle.
4-Y Perpendicular lines intersect to form right angles.
18-T Parallel lines never intersect.
6-L
$m \angle D C H=m \angle E B H$

II. Use the figure above. You should find 4 true statements.

5th Street is parallel to 6th Street. 6th Street is perpendicular to Elm Avenue.

10-S Elm Avenue is parallel to Disk Drive.
4th Street and Oak Avenue intersect to form right angles.

Elm Avenue is parallel to Oak Avenue.

## Why Couldn't the Two Elephants Go Swimming Together?

Give the measure of each numbered angle. Find your answer in the Code Key and notice the letter next to it. Write this letter in the box containing the number of the angle. (Assume that lines in each figure that do not intersect are parallel.)




| CODE |  |
| :---: | :---: |
| KEY |  |
| $27^{\circ}$ | A |
| $35^{\circ}$ | O |
| $40^{\circ}$ | R |
| $45^{\circ}$ | Y |
| $50^{\circ}$ | I |
| $55^{\circ}$ | P |
| $60^{\circ}$ | T |
| $70^{\circ}$ | U |
| $75^{\circ}$ | F |
| $90^{\circ}$ | N |
| $105^{\circ}$ | H |
| $120^{\circ}$ | E |
| $135^{\circ}$ | K |
| $140^{\circ}$ | L |
| $145^{\circ}$ | S |
| $153^{\circ}$ | D |

## What Did the Boy Candy Say to the Girl Candy?

Do each exercise and find your answer in the set of answers to the right. Write the letter of the answer in each box containing the number of the exercise. If the answer has a shade in each box containing that exercise number.
I. Classify each triangle two ways.

II. Find the measure of the third angle in each triangle.

(R) $25^{\circ}$
(12)

(N) $30^{\circ}$

(C) $45^{\circ}$
(L) $40^{\circ}$
(13) Two angles of a triangle have equal measures. If the third angle measures $120^{\circ}$, what is the measure of each of the equal angles?


## What Do You Get When You, , ,

1. Cross two ducks with a match?

Answer:

$$
\overline{37^{\circ}} \overline{57^{\circ}} \overline{99^{\circ}} \frac{}{67^{\circ}} \overline{104^{\circ}} \overline{76^{\circ}} \frac{59^{\circ}}{113^{\circ}} \overline{42^{\circ}} \overline{53^{\circ}} \frac{}{67^{\circ}} \overline{99^{\circ}} \overline{18^{\circ}}
$$

2. Cross a stick of dynamite with a lemon pie?

Answer:

$$
\overline{113^{\circ}} \overline{68^{\circ}} \overline{63^{\circ}} \overline{34^{\circ}} \overline{34^{\circ}} \overline{54^{\circ}} \overline{38^{\circ}} \overline{54^{\circ}} \overline{67^{\circ}} \overline{99^{\circ}} \overline{57^{\circ}} \overline{90^{\circ}} \overline{36^{\circ}} \overline{59^{\circ}} \frac{67^{\circ}}{}
$$

Find the angle measures indicated. Look for each answer in the code. Each time the answer appears, write the letter of the exercise above it.

(1) $m \angle B=$
(G) $m \angle J=$
(S) $m \angle W O X=$

(A) $m \angle P Q R=$
(N) $m \angle D A B=$
(C) $m \angle X Z Y=$
(E) $m \angle P Q T=$
( $) m \angle D A C=$
(1) $m \angle Y=$

(F) $m \angle M N L=$
(Q) $m \angle E F D=$
(M) $m \angle A O B=$
(K) $m \angle M=$
(B) $m \angle E=$
(B) $m \angle B O C=$ <br> \title{
Daffynition <br> \title{
Daffynition Decoder
} Decoder
}

For each exercise, find the angle measure indicated. Look for each answer in the code. Each time the answer appears, write

 the letter of the exercise above it.

Warehouse:
$\overline{105^{\circ}} \overline{40^{\circ}} \overline{36^{\circ}} \overline{78^{\circ}} \overline{151^{\circ}} \overline{55^{\circ}} \overline{45^{\circ}} \overline{146^{\circ}} \overline{36^{\circ}} \overline{151^{\circ}} \overline{105^{\circ}} \overline{40^{\circ}} \overline{135^{\circ}} \overline{42^{\circ}} \overline{34^{\circ}} \overline{55^{\circ}} \overline{146^{\circ}} \overline{78^{\circ}}$
Explain:
$\overline{42^{\circ}} \overline{55^{\circ}} \overline{78^{\circ}} \overline{146^{\circ}} \overline{116^{\circ}} \overline{56^{\circ}} \overline{36^{\circ}} \overline{74^{\circ}} \overline{29^{\circ}} \overline{34^{\circ}} \overline{135^{\circ}} \overline{100^{\circ}} \overline{55^{\circ}} \overline{56^{\circ}} \overline{60^{\circ}} \overline{56^{\circ}} \overline{98^{\circ}} \overline{135^{\circ}} \overline{100^{\circ}}$
(H) If $m \angle 1=50^{\circ}$, then $m L 2=$
(F) If $m L 3=120$, then $m L 4=$
(O) If $m L 2=35^{\circ}$, then $m \angle 1=$
(E) If $m L 4=45^{\circ}$, then $m L 3=$
(B) If $m L 6=29^{\circ}$, then $m L 8=$
(Y) If $m L 6=29^{\circ}$, then $m L 5=$
(C) If $m L 5=116$, then $m L 7=$
(I) If $m L 8=82^{\circ}$, then $m L 7=$
(A) If $m \angle 11=144$, then $m \angle 10=$
(N) If $m L 8=78^{\circ}$ and $m \angle 9=60^{\circ}$, then $m \angle 10=$
(D) If $m \angle 9=47^{\circ}$ and $m \angle 10=33^{\circ}$, then $m \angle 8=$
(U) If $m \angle 10=45^{\circ}$ and $m \angle 8=90^{\circ}$, then $m \angle 9=$
(M) If $m \angle 6=66^{\circ}$ and $m \angle 9=40^{\circ}$, then $m \angle 10=$
(T) If $m \angle 11=130^{\circ}$ and $m \angle 9=52$, then $m L 8=$
(W) If $m L 8=81^{\circ}$ and $m \angle 9=24$, then $m \angle 11=$
(R) If $m L 2=56$, then $m L 4=$
(L) If $m \angle 1=56$, then $m \angle 4=$
(S) If $m \angle 1=56$, then $m L 3=$

## Can a Polar Bear Go On a Safari?

Write the name that best describes each quadrilateral. (Put each quadrilateral in the smallest or most exact class to which it belongs.) Write the letter of the exercise in the box containing the number of the answer.
(1)

(


(2) rectangle
(15) trapezoid
(10) square
(18) parallelogram

(9) rectangle
(6) trapezoid
(17) parallelogram
(11) rhombus
(F)


(3) square
(4)
trapezoid
parallelogram
(7) rectangle
(R)


(K)

$\begin{array}{ll}\text { (15) } & \text { parallelogram } \\ \text { (1) } & \text { rectangle } \\ \text { (9) } & \text { rhombus } \\ \text { (12) } & \text { trapezoid }\end{array}$
(S)

(A)

(1)

(16) trapezoid
(5)
square
(14) rectangle
(8) rhombus

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

## Why Was Cinderella Kicked Off the Baseball Team?

For each exercise, circle the letter of each figure that belongs in the category named.
Arrange these letters to form a word. Then write this word on the line next to the name of the category.
(You may assume the following: sides that appear parallel are parallel; sides that appear perpendicular are perpendicular; sides that appear congruent are congruent.)
(1) quadrilaterals:

(2) parallelograms:

(3) rectangles: $\qquad$

(4) rhombuses:

$\qquad$

(5) squares: $\qquad$

(6) trapezoids:


## Why Didn't the Snobbish Potatoes Want Their Daughter to Marry a News Broadcaster?

Under each figure, circle the number-letter combination next to each word that correctly names the figure. Write the letter in the matching numbered box at the bottom of the page.
(1)


5-A parallelogram
16-0 rectangle
19-F square
(4)


20-N parallelogram
11-T rectangle
23-A square
(7)


13-A quadrilateral
26-R parallelogram 7-N trapezoid
(10)


4-W quadrilateral
12-0 parallelogram
24-N trapezoid
(2)


25-E parallelogram
13-1 rectangle
4-D rhombus
(5)


2-E quadrilateral
24-V parallelogram
8 -P rhombus
(8)


17-M rectangle
10-P square
14-S trapezoid
(11)


22-T quadrilateral
15-C rhombus
3-B square


9-U quadriateral
21-F parallelogram
1-H trapezoid
(6)


19-0 parallelogram
15-L rectangle 6-S rhombus
(9)


21-E parallelogram
18-1 rhombus
8-J trapezoid
(12)


10-S rectangle
18-M rhombus
24-T square

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

## Why Do Ants Visit the Zoo on Cold Days?

Write the word missing from each statement in the boxes next to the statement. Notice which letters are in numbered boxes. Write each of these letters in the matching numbered box at the bottom of the page.
A

B


D

(1) A triangle is a $\qquad$ with three sides and three angles.

(2)

A polygon with four sides and four angles is a $\qquad$

(3) A polygon with fivesides and five angles is a $\qquad$
(4) A polygon with six sides and six angles is a $\qquad$
(5) An octagon is a polygon with eight sides and eight $\qquad$
(6) A polygon with ten sides and ten angles is a $\qquad$
(7) In the set of figures above, Figure $A$ is a $\qquad$

(8) Figure $B$ is an $\qquad$
(9) Figure C is a $\qquad$

(10) Figure $D$ is a $\qquad$

(11) The point of intersection of two sides of a polygon is called a $\qquad$

(12) A line segment (not a side) connecting two vertices of a polygon is called a $\qquad$

(13) A polygon with all sides the same length and all angles the same measure is called a $\qquad$ polygon.

| 1 | 2 |  | 3 | 4 | 5 |  | 6 | 7 | 8 | 9 |  | 10 | 11 | 12 |  | 13 | 14 | 15 |  | 16 | 17 | 18 | 19 | 20 | 21 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

# Why Couldn't Orgo Buy a Round Trip Ticket? 

Follow the directions for each section. Each exercise will give you a number-letter pair. Write the letter in the matching numbered box at the bottom of the page.
I. Find each pair of congruent figures. Use the number from one figure and the letter from the other.

II. Complete each statement, then find your answer in the answer column. Use the number of the exercise and the letter of the answer.
$A A B C \cong A E D F$


Answers 6-11:
(E) $\angle D$
(H) $\angle F$
(S) $\overline{E F}$
(T) $\overline{D F}$
(E) $\overline{E D}$
(U) $\angle E$
 $A S K M \cong A N G J$
(12) $\overline{S K} \cong$
(15) $\angle S \cong$
(13) $\overline{K M} \cong$
(16) $\angle K \cong$
(14) $\overline{S M} \cong$
(17) $\angle M \cong$


Answers 12-17:
 $A R H X \cong A T Y L$
(18) $\overline{T Y} \cong$
(21) $\angle T \cong$
(19) $\overline{Y L} \cong$
(22) $\angle Y \cong$
(20) $\overline{T L} \cong$
(23) $\angle L \cong$


Answers 18-23:


# Does Any Animal Have More Than 9 Lives? 

Give the angle measures indicated. Find each answer in the Code Key and notice the letter next to it. Write this letter in the box containing the number of the exercise.


1. $m \angle B=$
2. $m \angle E=$
3. $m \angle D=$
4. $m \angle F=$
5. $m \angle J=$
6. $m \angle T=$
7. $m \angle S=$
8. $m \angle R=$


9. $m \angle Z=$
10. $m \angle V=$
11. $m \angle Q=$
12. $m \angle U=$
13. $m \angle H=$
14. $m \angle P=$
15. $m \angle M=$
16. $m \angle N=$



$$
A E F G \sim \triangle H I G
$$


17. $m \angle I G H=$
19. $m \angle F=$

ATLC ~ AOKC
21. $m \angle T=$
23. $m \angle O K C=$
18. $m \angle H=$
20. $m \angle E=$
22. $m \angle K O C=$


D-42


# What Did the Waitress Mean When She Yelled to the Cook： 

＂ $1+1$＂？

Fill in each blank with one of the answers at the bottom of the page．Then write the letter of the exercise above its correct answer．
The figure at the right is a circle with center at $O$ ．

（E）The points on a circle are all the same distance from the $\qquad$
（S）A line segment from the center to any point on the circle is a $\qquad$
（U）A line segment with both endpoints on the circle is a $\qquad$
（I）A chord that passes through the center of a circle is a $\qquad$
（O）A diameter of the circle in the drawing above is the segment $\qquad$ ．
（E）Which of the following is not a radius：$\overline{O A}, \overline{O D}$ ，or $\overline{B C}$ ？ $\qquad$
（S）Which of the following is not a chord：$\overline{B C}, \overline{O A}$ ，or $\overline{A C}$ ？ $\qquad$
（N）Part of a circle，such as between points 5 and $C$ ，is an $\qquad$
（E）An angle whose vertex is at the center of a circle is a $\qquad$
（P）Which of the following is not a central angle：LAOD，LCOD，or LBCA？
（S）Points $A, B, C$ ，and $D$ are all the same $\qquad$ from point $O$ ．
（O）If the length of $\overline{A C}$ is 20 cm ，then the length of $\overline{\boldsymbol{O C}}$ is $\qquad$
（N）If the length of $\overline{O A}$ is 20 cm ，then the length of $\overline{O D}$ is $\qquad$
（W）If the length of $\overline{O D}$ is 20 cm ，then the length of $\overline{A C}$ is $\qquad$
（L）The length of a radius is $\qquad$ the length of a diameter．
（T）The set of points in a plane at a fixed distance from a given point is a $\qquad$

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & E \\ & \hline \end{aligned}$ | $\frac{0}{\pi}$ |  | 入 | $\begin{aligned} & J \\ & \mathbb{N} \\ & \text { V } \end{aligned}$ | $\frac{\text { 世 }}{\text { 区 }}$ | $\begin{aligned} & \text { 믕 } \\ & \text { 등 } \end{aligned}$ | $1 \pi$ | $\begin{aligned} & \mathrm{O} \\ & \mathrm{O} \\ & \text { V } \end{aligned}$ | $\mid \mathrm{l}$ | $\begin{array}{\|c\|} \hline \underline{0} \\ \text { 승 } \end{array}$ |  | $10$ |  |  | $\begin{aligned} & \underline{E} \\ & \hline 0 \\ & \hline \infty \end{aligned}$ |  | $\frac{0}{0}$ | $10$ | E O V |

## $\bigcirc$ What Did the Secretary Say B $\because{ }^{\circ} \circ \quad$ to Her Boy Friend? $00^{\circ}$

For each exercise, circle the letter of each figure that is divided by a line of symmetry. Arrange these letters to form a word. Then write this word on the line next to the exercise number.

(2) $\qquad$
T

R



(3)

(4)

(5)

TOPIC 3-q: Lines of Symmetry

## What Did the Taxi Driver Say About His Daughter?

Write the name that best escrih
ispace figure. Then find your answer in the answer column. Write the letter of the answer in the box containing the number of the exercise.
(1)

(2)

(3)

(4)

(U) triangular pyramid
(T) hexagonal prism
(R) cone

(T) triangular prism
(E) sphere
(M) rectangular prism
(O) pentagonal prism
(O) cube
(9)
(10)

(11)

(12)

(U) pentagonal pyramid
(A) cylinder
(E) hexagonal pyramid
(Y) rectangular pyramid

## Why Did the River Guide Carry a Rifle?



1.8 m


Find the perimeter of each rectangle.

(10)
$\ell=48 \mathrm{~mm}$ $\mathrm{w}=32 \mathrm{~mm}$
(11) $\ell=6.2 \mathrm{~km}$
$\mathrm{w}=4.7 \mathrm{~km}$
(12) $\ell=12 \mathrm{in}$.

$$
\mathrm{w}=12 \mathrm{in} .
$$

(12) $w=12$ in
(13) Find the perimeter of a sheet of typing paper $8 \frac{1}{2}$ in. wide and 11 in. long.

How many feet of border are needed to go around a square bulletin board that is 4.5 ft on each side?


# What Is the Title? 

## TO FIND THE TITLE OF THIS PICTURE:

Do each exercise below and find your answer in the code. Each time the answer appears, write the letter of the exercise above it.


CODED TITLE:

I. Find the perimeter of each figure.
(O) Triangle with sides of 8.2 cm , 3.9 cm , and 4.5 cm $\qquad$ cm
(G) Square with sides of 16.4 m $\qquad$ m
(E) Parallelogram with sides of 40 cm and 75 cm $\qquad$ cm
(A) Regular decagon with sides of 0.63 km $\qquad$ km
(B) Rectangle with sides of 22 in. and 28 in.
$\qquad$ in.
(I) Equilateral triangle with sides of 5.25 ft $\qquad$ ft
(H) Regular hexagon with sides of 2.75 in. $\qquad$ in.
(U) Rhombus with sides of 50 ft $\qquad$ ft
II. Solve.
(L)

The width of a large American flag is 8 ft . Its length is 5 ft more than its width. Find its perimeter.
(M) The perimeter of a square window is 360 cm . Find the length of one side.
$\qquad$ cm
(R) A pennant is shaped like an isosceles triangle. The short side is 14 in . long and is half the length of each longer side. Find the perimeter of the pennant.
$\qquad$ in.
(N) The width of a rectangular poster is 16 in. Its length is twice its width. Find its perimeter. $\qquad$ in.
(F) The perimeter of a triangle is 38 ft . One side is 14 ft long. Another side is 9 ft long. How long is the third side? $\qquad$ ft
(S) The longest side of a triangular sail is 9 m long. The second side is 1.5 m shorter than the longest side. The third side is half the length of the longest side. What is the perimeter?
$\qquad$ m

## Why Did the Piano Player Bang Her Head Against the Keyboard?

Find the circumference ( $\boldsymbol{C}$ ) of each circle, given the diameter ( $\boldsymbol{d}$ ) or radius ( $\boldsymbol{r}$ ).Use 3.14 for $\pi$. Draw a straight line connecting the square by the exercise to the square by its answer. The line will cross a number and a letter. Write the letter in the matching numbered box at the bottom of the page.
(1) $d=3 \mathrm{~cm}$
(2) $d=8 \mathrm{in}$.
(3) $d=7 \mathrm{~cm}$
(4) $d=40 \mathrm{in}$.
(5) $d=9.2 \mathrm{~cm}$
(6) $d=1.5 \mathrm{in}$.
(7) $d=600 \mathrm{~m}$
(8) $d=23 \mathrm{in}$.
(9) $d=10 \mathrm{~cm}$
(10) $r=1 \mathrm{in}$.
(11) $r=6 \mathrm{~cm}$
(12) $r=15 \mathrm{in}$.
(13) $r=2.2 \mathrm{~cm}$
(14) $r=48 \mathrm{in}$.
(15) $r=3.9 \mathrm{~cm}+$
(16) $r=2.5 \mathrm{in}$.
(17) $r=2.5 \mathrm{~cm}$
(18) $r=50 \mathrm{~m}$
(9)
(13)
(16)
6)
(2)
(15)
(3)
(7)
(S)
(4)
(11)
(5)
(12)
(17)
(14)
(18)
(10)
(8)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

MIDDLE SCHOOL MATH WITH PIZZAZZ! BOOK D © Creative Publications

Answers A-I:



|  |  |  |  |
| :---: | :---: | :---: | :---: |

## What Does a Tuba Call Its Father?

Give the number of square units in each figure. Find your answer and cross out the letters above it. When you finish, the answer to the title question will remain.
(1)

(2)

(3)

(4)

(5)

(7)

(8)

(9)

(10)

(11)

(12)



3


9

| TH | TU | GR | OO | BA | MI | BO | OM | MY | US | PA | IR | ST | OP | UB | PA | LS | AD | AD |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 32 | 15 | 9 | 42 | 20 | 12 | 28 | 21 | 44 | 18 | 8 | 45 | 24 | 14 | 16 | 27 | 30 | 46 | 10 |



## Why Do Elephants Have Ivory Tusks?

Do each exercise and find your answer in the answer columns. Write the letter of the answer in each box containing the number of the exercise.
I. Find the area of each figure.
(1)

(2)

(3)


II. Find the area of the shaded region in each figure.
(7) yard with sandbox


20 ft
(8) wall with windows


16 ft
(9) sidewalk around pool

(11) A rose garden in the city park is rectangular and is 9 m wide. If the area of the rectangle is $144 \mathrm{~m}^{2}$, what is the length of the garden?

## ANSWERS

(A) $219 \mathrm{ft}^{2}$
(T) $68 \mathrm{in} .^{2}$
(U) $251 \mathrm{ft}^{2}$
(G) $124 \mathrm{~cm}^{2}$
(C) $21 \mathrm{~m}^{2}$
(N) $\$ 440$
(L) $20 \mathrm{~m}^{2}$
(F) $\$ 520$
(V) $108 \mathrm{in} .^{2}$
(E) $24 \mathrm{~m}^{2}$
(D) $88 \mathrm{ft}^{2}$
(P) 19 m
(I) $135 \mathrm{~cm}^{2}$
(S) $171 \mathrm{ft}^{2}$
(R) 16 m
(B) $165 \mathrm{ft}^{2}$
(W) $119 \mathrm{in}^{2}{ }^{2}$
(O) $18 \mathrm{~m}^{2}$

| 6 | 11 | 3 | 10 | 3 | 10 | 1 | 9 | 5 | 3 | 7 | 2 | 8 | 11 | 7 | 9 | 4 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

## How Was the Wooden Marionette Related to the Wooden Diving Board?

Use a calculator to solve each problem (round decimal answers to the nearest tenth). Find your answer in the answer column and notice the two letters next to it. Write these letters in the spaces over the exercise number at the bottom of the page.

WORLD RECORD: The largest jigsaw puzzle ever made was 85 by 55 ft and had 15,520 pieces. It was constructed by the United Way in Keene, New Hampshire.

1. What was the area of the puzzle in $\mathrm{ft}^{2}$ ?
2. What was the area of the puzzle in in. ${ }^{2}$ ?
3. What was the average size of each piece?

WORLD RECORD: The world's largest quilt, designed by A. Platteau, measures 69.6 by 99.5 ft . It was made from 16,140 equal-sized squares sewn together.
4. What is the area of the quilt in $\mathrm{ft}^{2}$ ?
5. What is the area of the quilt in in.? ?
6. What is the area of each square?

WORLD RECORD: The world's longest buffet table was $3,304.8 \mathrm{ft}$ long and 8.2 ft wide. On June 19, 1982, approximately 4,000 people, including HM The King of Sweden, were seated at the table.
7. What was the area of the table? $\qquad$ $\mathrm{Ht}^{2}$
8. What was the perimeter of the table?
9. If 4,000 people were equally spaced around the perimeter of the table, how far apart were they sitting? $\qquad$ ft

WORLD RECORD: The largest American flag ever made was first displayed on March 22,1980, and measures 411 by 210 ft .
10. What is the area of the flag in $\mathrm{ft}^{2}$ ?
11. What is the area of the flag in $\mathrm{yd}^{2}$ ?
12. The fabric used for the flag weighs about 1.6 lb per $\mathrm{yd}^{2}$. About how much does the flag weigh?
$\qquad$ $\mathrm{ft}^{2}$
$\qquad$ $\mathrm{yd}^{2}$ ft
$\qquad$

Answers
(HA) 1.7
HE
$997,228.8$
(OM) 46.5
(DE) 7,130
(LY) 673,200
(TR) 15,344
(EY) $27,099.4$
(WO) 2.1
(DT) 4,675
(SA) 86,310
(RI) $917,106.8$
(ME) 6,925.2
(FA) 6,626
(ST) 14,904
(EE) 61.8
(VO) 4,835
(MI) 9,590
(TH) 43.4
(EN) 83,820
(ER) $28,186.4$

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

## What Happened to Mr. Meter When Mrs. Meter's Mother Flew in for a Visit?

Cross out the box containing each correct answer. When you finish, write the letters from the remaining boxes in the spaces at the bottom of the page.
I. Find the PERIMETER and the AREA of each parallelogram.

5.1 cm

II. Solve.
(7) The base of a parallelogram is 10 in . The height is 2 in . more than half the base. Find the area.
(9) The area of a parallelogram is $60 \mathrm{ft}^{2}$. The height is 5 ft . How long is the base?

| $\begin{gathered} \hline \mathrm{T} \\ 31.6 \mathrm{~cm} \end{gathered}$ | $\begin{gathered} \mathrm{SH} \\ 17.4 \mathrm{~cm} \end{gathered}$ | $\begin{gathered} \mathrm{HE} \\ 33.8 \mathrm{~cm} \end{gathered}$ | $\begin{gathered} \text { RE } \\ 15 \mathrm{~cm} \end{gathered}$ | $\begin{gathered} \mathrm{E} \\ 32 \mathrm{in} .^{2} \end{gathered}$ | $\begin{aligned} & \mathrm{WE} \\ & 56 \mathrm{~m} \end{aligned}$ | $\begin{gathered} \text { WA } \\ 1.38 \mathrm{~m}^{2} \end{gathered}$ | $\begin{gathered} \text { IT } \\ 70{\mathrm{in} .^{2}}^{2} \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{gathered} \mathrm{SC} \\ 37.6 \mathrm{~cm}^{2} \end{gathered}$ | $\begin{gathered} \mathrm{A} \\ 180 \mathrm{~m}^{2} \end{gathered}$ | $\begin{aligned} & \mathrm{NT} \\ & 12 \mathrm{ft} \end{aligned}$ | $\begin{gathered} \hline \mathrm{EN} \\ 18 \mathrm{~m} \end{gathered}$ | $\begin{gathered} \text { DA } \\ 380 \mathrm{ft} \end{gathered}$ | $\begin{gathered} \mathrm{RE} \\ 1.26 \mathrm{~m}^{2} \end{gathered}$ | $\begin{gathered} \mathrm{AL} \\ 16.32 \mathrm{~cm}^{2} \end{gathered}$ | $\begin{gathered} \mathrm{T} \\ 16 \mathrm{ft} \end{gathered}$ |
| $\begin{gathered} \hline \mathrm{PR} \\ 5.4 \mathrm{~m} \end{gathered}$ | $\begin{gathered} \mathrm{IM} \\ 350 \mathrm{ft} \end{gathered}$ | $\begin{gathered} \hline \mathrm{V} \\ 39.06 \mathrm{~cm}^{2} \end{gathered}$ | $\begin{gathered} \text { ET } \\ 84 \mathrm{in} .^{2} \end{gathered}$ | $\begin{gathered} \text { TY } \\ 40.5 \mathrm{~cm}^{2} \end{gathered}$ | $\begin{gathered} \text { IS } \\ 26 \mathrm{in} . \end{gathered}$ | $\begin{gathered} \hline \text { ER } \\ 6.3 \mathrm{~m} \end{gathered}$ | $\begin{gathered} \text { IT } \\ 8,100 \mathrm{ft}^{2} \end{gathered}$ |
|  |  |  |  |  |  |  |  |




# What Happens When the Smog Lifts in Los Angeles, California? 



Find the AREA and the-PERIMETER of each triangle below. Look for both answers in the rectangle. Shade in each area containing a correct answer.

(4)

(7)

(5)

15 m

(8)

(9)


MIDDLE SCHOOLMATH WITH PIZZAZZ! BOOK D © Creative Publications

## Why Was Igor Unhappy About His Spelling Test Even Though He Got Everything Right?

Give both the perimeter and area of each figure. Find each answer in the appropriate answer column. Fill in the correct unit of measure for each answer you choose, then circle the number-letter next to it. Write the letter in the matching numbered box at the bottom of the page.
(1)

(2)

(3)

(4)

(5)



11 cm
(10) Rectangle with sides of 22 cm and 28 cm .
(8)

(11)
Square with sides measuring 12 in.


| Perimeters |  |
| :--- | ---: |
| 95 | $21-\mathrm{S}$ |
| 24 | $17-\mathrm{E}$ |
| 67 | $18-\mathrm{S}$ |
| 10.1 | $8-\mathrm{E}$ |
| 46 | $12-\mathrm{L}$ |
| 152 | $16-\mathrm{R}$ |
| 100 | $25-\mathrm{W}$ |
| 38 | $20-\mathrm{T}$ |
| 32 | $1-\mathrm{H}$ |
| 40 | $4-\mathrm{M}$ |
| 9.4 | $27-\mathrm{L}$ |
| 51 | $5-1$ |
| 74 | $22-\mathrm{E}$ |
| 34 | $25-\mathrm{F}$ |
| 48 | $7-\mathrm{S}$ |
| 166 | $15-\mathrm{T}$ |
| 49 | $8-\mathrm{A}$ |
| 80 | $16-\mathrm{H}$ |


| Areas |  |
| :--- | ---: |
| 58 | $13-\mathrm{L}$ |
| 34 | $24-\mathrm{A}$ |
| 300 | $6-\mathrm{S}$ |
| 60 | $21-\mathrm{H}$ |
| 136 | $4-\mathrm{R}$ |
| 3.08 | $29-\mathrm{S}$ |
| 64 | $11-\mathrm{O}$ |
| 24 | $26-\mathrm{O}$ |
| 144 | $27-\mathrm{R}$ |
| 3.26 | $19-1$ |
| 130 | $28-\mathrm{D}$ |
| 1,500 | $2-\mathrm{E}$ |
| 203 | $11-\mathrm{A}$ |
| 48 | $9-\mathrm{D}$ |
| 240 | $13-\mathrm{P}$ |
| 616 | $19-\mathrm{O}$ |
| 120 | $23-\mathrm{R}$ |
| 576 | $7-\mathrm{H}$ |

## What Game Did Tarzan Like to Play?

Do each exercise below. Find your answer in the answer columns and notice the letter next to it. Look for this letter in the string of letters near the bottom of the page and CROSS IT OUT each time it appears. When you finish, write the remaining letters in the rectangle at the bottom of the page.
I. Find the area of each trapezoid.

(2)

(3)

(4)

(5)


(7) $b_{1}=11$ in.
$b_{2}=9$ in.
h $=8$ in.
(8) $b_{1}=3.4 \mathrm{~m}$
$\mathrm{h}=5.0 \mathrm{~m}$
(9) $b_{1}=70 \mathrm{~cm}$
$\mathrm{b}_{2}=30 \mathrm{~cm}$
$\mathrm{h}=25 \mathrm{~cm}$
II. An artist designed a base for one of his sculptures with the dimensions shown.

The top and bottom are rectangles. The sides are isosceles trapezoids.
(10) Find the area of the front face ( 20 cm base).
(11) Find the area of the side face ( 12 cm base).
(12) Find the area of the top.


| (Y) $76 \mathrm{in} .2^{2}$ | (N) $105 \mathrm{~cm}^{2}$ | (O) $80 \mathrm{in} .^{2}$ | (D) $3.68 \mathrm{~cm}^{2}$ | (S) $3.92 \mathrm{~cm}^{2}$ |
| :--- | :--- | :--- | :--- | :--- |
| (L) $24.5 \mathrm{~m}^{2}$ | (B) $30 \mathrm{~cm}^{2}$ | (T) $120 \mathrm{~cm}^{2}$ | (2) $1,360 \mathrm{~cm}^{2}$ | (F) $5.6 \mathrm{~m}^{2}$ |
| (A) $72 \mathrm{~cm}^{2}$ | (B) $69 \mathrm{ft}^{2}$ | (P) $26.2 \mathrm{~m}^{2}$ | (M) $75 \mathrm{in.}^{2}$ | (1) $60 \mathrm{~cm}^{2}$ |
| (1) $1,400 \mathrm{~m}^{2}$ | (C) $95 \mathrm{~cm}^{2}$ | (G) $77 \mathrm{ft}^{2}$ | (H) $1,250 \mathrm{~cm}^{2}$ | (E) $4.5 \mathrm{~m}^{2}$ |

D T B C H ORINFAMTUOZDNYFALTBPIEGUNSH

## Answer to puzzle:

| Answers $10-18:$ |
| :--- |
| (P) $1,416 \mathrm{~m}^{2}$ |
| (O) $78.5 \mathrm{~cm}^{2}$ |
| (D) $36.815 \mathrm{~cm}^{2}$ |
| ( $7.065 \mathrm{~m}^{2}$ |
| (H) $0.2826 \mathrm{~km}^{2}$ |
| (N) $108.74 \mathrm{in} .^{2}$ |
| (M) $1,256 \mathrm{~m}^{2}$ |
| (T) $153.86 \mathrm{in}^{2}$ |
| (S) $211.36 \mathrm{ft}^{2}$ |
| (L) $38.465 \mathrm{~cm}^{2}$ |
| (F) $3.14 \mathrm{~cm}^{2}$ |
| (Y) $200.96 \mathrm{ft}^{2}$ |
| ( $0.3416 \mathrm{~km}^{2}$ |
| (R) $8.415 \mathrm{~m}^{2}$ |
| (F) $113.04 \mathrm{in} .^{2}$ |

What Is Dangerous about Living for 7 Days Find the area of each circle. Use 3.14 for $\pi$. Find your answer in the appropriate answer column. Write the letter of the answer in the space containing the number of the exercise. If the answer has a shade in the space instead of writing a letter in it.

(๑)
()

(ค) $\oplus$


## CODED TITLE:

$\overline{5,024} \overline{176.63} \overline{0.7} \overline{40} \overline{1,017.36} \overline{0.7} \overline{5.2} \overline{4,954} \overline{18.84} \overline{47.1} \quad \overline{3} \quad \overline{113.04} \overline{0.7} \quad \overline{1.69} \quad \overline{5,024} \overline{28.26} \quad \overline{4.40} \quad \overline{21.23}$
$\begin{array}{lllllllllllllllllllllllllll}\overline{16.33} & \overline{47.1} & \overline{0.7} & \overline{172.38} & \overline{36} & \overline{1.54} & \overline{251.2} & \overline{18.84} & \overline{176.63} & \overline{0.7} & \overline{984.46} & \overline{15} & \overline{16.33} & \overline{16.33} & \overline{4.40}\end{array}$


(G) $r=\_$in.
(A) $C=$ $\qquad$ in.
(I) $A=$ $\qquad$ in. ${ }^{2}$

(D) $d=$ $\qquad$ m
(O) $C=$ $\qquad$ m
(H) $A=$ $\qquad$ $m^{2}$
3. $d=80 \mathrm{ft}$
(C) $r=$ $\qquad$ ft
4. $r=18 \mathrm{in}$.
(S) $d=$ $\qquad$ in.
(U) $C=$ $\qquad$ ft
(L) $C=$ $\qquad$ in.
(W) $A=$ $\qquad$ $\mathrm{ft}^{2}$
(K) $A=$ $\qquad$ in. ${ }^{2}$
5. $d=1.4 \mathrm{~cm}$
(E) $r=\_\mathrm{cm}$
6. $r=7.5 \mathrm{~mm}$
(T) $C=$ $\qquad$ cm
(Q) $A=\ldots \mathrm{cm}^{2}$
$\qquad$
(F) $d=$
$\qquad$ mm
(N) $C=$ $\qquad$ mm
(R) $A=$ $\qquad$ $\mathrm{mm}^{2}$

## Why Is a Mathematician Like an Airline?

Round each answer to the nearest hundredth (if necessary) and find it in the appropriate answer column. Use 3.14 for $\pi$. Fill in the correct unit of measure for each answer you choose. Write the letter of the exercise in the box containing the number of the answer.

1. A circle has a radius of $\mathbf{1 2} \mathbf{i n}$. Find:
(E) The diameter of the circle.
(H) The circumference of the circle.
(T) The area of the circle.
2. A circle has a radius of 4.4 cm . Find:
(S) The diameter of the circle.
(Y) The circumference of the circle.
(H) The area of the circle.
3. A circle has a diameter of 60 m . Find:
(I) The radius of the circle.
(O) The circumference of the circle.
(T) The area of the circle.
4. A circle has a diameter of 1.8 km . Find:
(O) The radius of the circle.
(E) The circumference of the circle.
(U) The area of the circle.
5. Solve.
(B) Jack's cow is tied to a beanstalk with a piece of rope that is 15 ft long. What is the area of the circle in which the cow can graze?

(4) 27.63
(14) 61.43
(16) 30
(2) 75.36
(12) 461.36
(21) 8.8
(17) 172.4
(13) 24
(9) 60.79
(1) 2,826
(8) 452.16
(5) 25.51
(7) 188.4
(10) 2,516

Answers 4-5:
(15) 898
(6) 706.5
(13) 5,174
(5) 24,930
(11) 2.54
(20) 0.79
(19) 0.9
(18) 942
(10) 690.5
(14) 2.91
(15) 5,024
(3) 5.65
(17) 0.87
(12) 25,120
(T) A round game table has a diameter of 1 m . How much plastic laminate is needed to cover the top of this table?
(S) The diameter of the earth at the equator is about $8,000 \mathrm{mi}$. Based on this figure, how far is it around the earth?
(P) Radio station KROQ broadcasts in all directions to a distance of 40 mi. How many square miles are in the station's broadcast area?
(L) WORLD RECORD: The world's largest Ferris Wheel was built in London in 1897. The wheel had a radius of 150 ft . How far would you travel in one turn of this wheel?


| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |



How Do You Get a One－Armed Monkey Down From a Coconut Tree？

Solve each problem．Use 3.14 for $\pi$ ．Find your answer and cross out the letter next to it．When you finish，the answer to the title question will remain．

| ш | 95 in．${ }^{2}$ |
| :---: | :---: |
| $\Sigma$ | 9.2 in． |
| $\vdash$ | $706.5 \mathrm{~cm}^{2}$ |
| － | 8.3 m |
| 山 | 8.4 in． |
| 凹 | 26 ft |
| エ | $1,670 \mathrm{ft}^{2}$ |
| $\vdash$ | 131 in．${ }^{2}$ |
| $\bigcirc$ | 30 ft |
| $>$ | 9.6 in． |
| $<$ | $127.2 \mathrm{~cm}^{2}$ |
| 凹 | 2.5 cm |
| ш | 28 ft |
| $>$ | 69.5 in．${ }^{2}$ |
| $\vdash$ | 21.5 in．${ }^{2}$ |
| － | 154 in．${ }^{2}$ |
| $<$ | $814.5 \mathrm{~cm}^{2}$ |
| ৫ | 7.8 m |
| z | $593.5 \mathrm{~cm}^{2}$ |
| － | 59 in．${ }^{2}$ |
| 3 | 30.5 in．${ }^{2}$ |
| $\omega$ | 78.5 in．${ }^{2}$ |
| エ | $1,960 \mathrm{ft}^{2}$ |
| $\vdash$ | $113.0 \mathrm{~cm}^{2}$ |

1．Find the diameter of a circle if the circumference is 8 cm ．Round to the nearest tenth．

2．Find the diameter of a circle if the circumference is 24.5 m ．Round to the nearest tenth．

3．The largest living thing on earth is a California sequoia tree named the＂General Sherman．＂The circumference of its trunk is about 82 ft ． Find the diameter of the trunk to the nearest whole number．

4．A revolving water sprinkler sprays water in all directions to a distance of－25 ft．What area does it cover？Round to the nearest $10 \mathrm{ft}^{2}$ ．

5．Pizza Mind Pizza sells a large pizza with a diameter of 14 in ．and a medium pizza with a diameter of 11 in ．Find the following to the nearest whole number：
A．The area of the large pizza．
B．The area of the medium pizza．
C．How much larger is the large pizza？
6．Nick Claus plans to have a model train running in a circle around his holiday tree．How many feet of track will he need if the diameter of the circle is 9.5 ft ？Round to the nearest whole number．

7，A record has a radius of 15 cm ．The label has a radius of 6 cm ．Find the following to the nearest tenth：
A．The area of the record （including the label）．
B．The area of the label．
C．The area of the record that is not covered by the label．


8 The diameter of a basketball hoop is 18 in ．The circumference of a basketball is 30 in ．
A．Find the diameter of the basketball．
Round to the nearest tenth．
B．How much less is the diameter of the basketball than the diameter of the hoop？

9 A circle is cut out of a piece of plywood that is 10 in ．square． The scraps are thrown away．
A．Find the area of the circle．
B．How many square inches of plywood are thrown away？


Write the correct formula to use in solving each problem. Find your answer in the Code Key and notice the letter next to it. Write this letter in the box containing
 the number of the problem.

1 A botanical garden was designed in the shape of a pentagon. How many meters of fencing are needed to go around the garden?

2 How many square feet of wallpaper are needed to cover a wall 8 ft high by 15 ft wide?

3 The diameter of a circular running track is 140 yd. How far would you run in one lap?

4 How much weather stripping is needed to go around a square window measuring 42 in. on a side?

5 A dangerous criminal has escaped from prison. The police believe he could not have traveled more than 10 mi in any direction from the prison. How many square miles must be searched?

6 How much lace edging is needed to go around a rectangular tablecloth measuring 52 in . by 70 in .?


7 How many tiles are needed to cover a square patio measuring 18 ft on a side if each tile covers 1 sq ft ?

8 The orbit of the earth around the sun is approximately a circle with a radius of $93,000,000 \mathrm{mi}$. How far do we travel in one orbit around the sun?

9 How much felt is needed to make this banner?


10 If each bag of fertilizer covers $2,000 \mathrm{sq} \mathrm{ft}$, how many bags are needed to fertilize a rectangular lawn measuring 100 ft by 160 ft ?

11 A lighthouse beacon can be seen 24 mi in all directions. What is the area over which the beacon can be seen?

12 Popeye put colorful plastic tape around the edge of a triangular sail. The sail had sides of $10 \mathrm{ft}, 15 \mathrm{ft}$, and 18 ft . How many feet of tape did he use?


## What Happened to Zelda After She Swallowed Two Nickels, Three Dimes, and a Quarter?

Give the SURFACE AREA of each prism. Find your answer in the answer columns and notice the two letters next to it. Write these letters in the spaces over the exercise number at the bottom of the page.
(1)

(2)

(5)

(4)

(3)

(7)

A rectangular storage box is 12 in . wide, 15 in . long, and 9 in . high. How many square inches of colored paper are needed to cover the surface of the box?
(8) A teacher made a pair of foam dice to use in math games. Each cube measured 10 in. on a side. How many square inches of fabric were needed to cover the two cubes?
(TH) $73 \mathrm{~m}^{2}$
(AL) 23.12 cm
(AS) $94 \mathrm{~cm}^{2}$
(EN) 846 in. ${ }^{2}$
(IT) $86 \mathrm{~m}^{2}$
(CH) $1,200 \mathrm{in} .^{2}$
(ER) $104 \mathrm{~m}^{2}$

Answers
(ER $318.26 \mathrm{~m}^{2}$
(NO) $25.92 \mathrm{~cm}^{2}$
(AN $9,600 \mathrm{in} .^{2}$
(PL) 1,050 in. ${ }^{2}$
(GE) $300.56 \mathrm{~m}^{2}$
(TR $85 \mathrm{~cm}^{2}$

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 4 | 2 | 7 | 1 | 5 | 8 | 3 | 6 |  |  |  |  |  |  |

## What Is Cold And Comes In Cans?

Find the surface area of each figure. Cross out the box containing each correct answer. When you finish, write the letters from the remaining boxes in the spaces at the bottom of the page.


| MU |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $340 \mathrm{~m}^{2}$ | RI |  |  |  |  |  |
| $224 \mathrm{in} .^{2}$ | CH <br> $3,120 \mathrm{~mm}^{2}$ | OW <br> $148 \mathrm{~cm}^{2}$ | OP <br> $80 \mathrm{in}^{2}{ }^{2}$ | FO <br> $3,300 \mathrm{~mm}^{2}$ | IL <br> $118 \mathrm{in} .^{2}$ |  |
| IB | AR | CL | EA | CA | NS | KE |
| $81.5 \mathrm{~cm}^{2}$ | $22.6 \mathrm{~m}^{2}$ | $60.45 \mathrm{~cm}^{2}$ | $312 \mathrm{~m}^{2}$ | $145.92 \mathrm{~cm}^{2}$ | $25.8 \mathrm{~m}^{2}$ | $406 \mathrm{in} .^{2}$ |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

## Why Did Humpty Dumpty Have a Great Fall?

Do each exercise and find your answer in the answer column. Write the letter of the answer in each box containing the number of the exercise. Use 3.14 for $\pi$.

Find the lateral area and the total surface area of each cylinder.

(1) lateral area: $\qquad$
(2) total area: $\qquad$

70 cm
(5) lateral area: $\qquad$
(6) total area: $\qquad$
II. Find the total surface area of each cylinder.
(9) $r=3 \mathrm{~cm}$
(10) $r=8 \mathrm{in}$.
$h=8 \mathrm{in}$.
(11) $d=10.8 \mathrm{~m}$ $h=2.6 \mathrm{~m}$
III. Solve.
(12) A can of tomato juice is a cylinder with a radius of 7.5 cm and a height of 20 cm . What is the area of the label around the can?
(13) A steel oil tank is a cylinder with a diameter of 12 ft and a height of 18 ft . How many square feet of steel were needed to make the tank?

(7) lateral area: $\qquad$
(8) total area: $\qquad$

(3) lateral area: $\qquad$
(4) total area: $\qquad$
(Y) $412.18 \mathrm{ft}^{2}$
(R) $803.84 \mathrm{in} .^{2}$
(H) $792.16 \mathrm{~m}^{2}$
(T) 251.2 ft 2
(M) $904.32 \mathrm{ft}^{2}$
(L) $861.6 \mathrm{~cm}^{2}$
(S) $367.38 \mathrm{~m}^{2}$
(D) $376.8 \mathrm{~cm}^{2}$
(P) $244.92 \mathrm{~cm}^{2}$
(C) $815.18 \mathrm{ft}^{2}$
(K) $11,304 \mathrm{~cm}^{2}$
(B) $942 \mathrm{~cm}^{2}$
(E) $351.68 \mathrm{ft}^{2}$
(N) 775.14 in. ${ }^{2}$
(U) $533.8 \mathrm{~cm}^{2}$
(A) $271.296 \mathrm{~m}^{2}$
(O) $876.06 \mathrm{~m}^{2}$
(V) $12,412 \mathrm{~cm}^{2}$
(F) $8,792 \mathrm{~cm}^{2}$
(I) $311.046 \mathrm{~m}^{2}$

| 3 | 8 | 13 | 11 | 6 | 4 | 2 | 9 | 5 | 8 | 10 | 11 | 12 | 11 | 1 | 7 | 2 | 13 | 13 | 4 | 10 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

Mystery: What happened when a 6-year old, a 5-year old, a 4-year old, a 3-year old, and a 2-year old joined to form a basketball team?

Find the volume of each prism in cubic units. Write the letter of the exercise in the box containing the answer.

(L) $\ell=3 ; w=7 ; h=2$

(W) $\ell=4 ; w=3 ; h=6$

(E) $l=5 ; w=5 ; h=3$

| 40 | 24 | 36 | 16 | 32 | 72 | 64 | 12 | 48 | 80 | 45 | 28 | 75 | 42 | 30 | 60 | 18 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

# What Movie Is about a Kid Who Ran Away from Home with His Bicycle? 

Find each answer in the answer columns and notice the two letters next to it. Write these letters in the spaces over the exercise number at the bottom of the page.
I. Find the volume of each rectangular prism.

II. Solve.
(4) A classroom.is 26 ft wide, 32 ft long, and 9 ft high. What is the volume of the room in cubic feet?
(6) If all the gold that has been produced in the last 500 years could be melted to form a single cube, each side would measure about 16 m . How many cubic meters of gold is this?
(8) Krispy Kritters Cereal used to come in a box with a volume of $2,850 \mathrm{~cm}^{3}$. However, The Krispy Kritters Co. designed a new larger box 22.5 cm wide, 6.2 cm deep, and 30 cm high. How many more cubic centimeters will the new box hold than the old box?
(5) A swimming pool is 20.6 m long, 8.5 m wide, and has an average water depth of 1.7 m . Find the volume of water needed to fill the pool.
(7) A refrigerator is 3 ft wide, 2.5 ft deep, and 6 ft high. The walls and other parts of the refrigerator take up $20 \mathrm{ft}^{3}$. How many cubic feet are left for food?
(9) An aquarium weighs 22.5 lb when empty. The aquarium is 30 in . long, 14 in . wide, and is filled with water to a depth of 18 in . Water weighs 0.036 pound per cubic inch. How much does the aquarium weigh when it is full of water?


# What Is Big, Gray, and Lives in California? 

Find the volume of each prism. Write the letter of the exercise in the box above the answer at the bottom of the page.





MIDDLE SCHOOL MATH WITH PIZZAZZ! BOOK D
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D-69

1. What Is the Best Way to Paint a Rabbit?

$$
\overline{4} \overline{7} \overline{2} \overline{8} \overline{3} \overline{11} \overline{5} \overline{10} \overline{1} \overline{11} \overline{3} \frac{}{6}
$$

2. What Candy Do Kids Eat on the Playground?

$$
\overline{11} \overline{5} \overline{9} \overline{5} \overline{10} \overline{10} \overline{1} \overline{5} \overline{9} \overline{5} \overline{10}
$$

Do each exercise and find your answer in the answer column. Write the letter of the answer above the exercise number each time it appears in the code. Use 3.14 for $\pi$.
I. Find the volume of each cylinder.
(1)

(2)

(3)

(4)

20 in.
(5)

(7) $r=8 \mathrm{in}$.
$h=3$ in.
(8) $r=2.5 \mathrm{~mm}$ $h=60 \mathrm{~mm}$
(6)


25 m
(9) $d=10 \mathrm{~m}$
$h=7.2 \mathrm{~m}$

## Answers

(M) $814.13 \mathrm{~cm}^{3}$
(C) $565.2 \mathrm{~m}^{3}$
(N) 381.36 mL
(A) $141.3 \mathrm{~cm}^{3}$
(B) $14.8 \mathrm{~m}^{3}$
(I) 602.88 in 3
(P) $675 \mathrm{~cm}^{3}$
(U) $7,490 \mathrm{~m}^{3}$
(H) $1,177.5 \mathrm{~mm}^{3}$
(R) 452.16 mL
(W) $2,260.8 \mathrm{in} .{ }^{3}$
(L) $382.8 \mathrm{~cm}^{3}$
(T) $15.4 \mathrm{~m}^{3}$
(Y) $846.23 \mathrm{~cm}^{3}$
(O) 717.8 in. ${ }^{3}$
(S) $376.8 \mathrm{~cm}^{3}$
(G) $1,224.5 \mathrm{~mm}^{3}$
(E) $7,850 \mathrm{~m}^{3}$
(D) $614.2 \mathrm{~m}^{3}$
II. Solve.
(10) Shawn is making a candle using a cylindrical mold with a radius of 2 cm and a height of 30 cm . How many cubic centimeters of wax are needed for the candle?
(11) A mug in the shape of a cylinder has a base with a radius of 4 cm . How many milliliters of liquid does it hold if filled to a height of 9 cm ?
(Hint: 1 cm 3 holds 1 mL .)
MIDDLE SCHOOL MATH WITH PIZZAZZ! BOOK D
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Find each answer in the appropriate set of boxes at the bottom of the page.
Write the letter of the exercise in the box containing the answer.
I. Find the length of one side (s) of each square.
©

(1)

(E)

II. Find the square root.
(S) $\sqrt{49}$
(L) $\sqrt{16}$
(1) $\sqrt{100}$
(0) $\sqrt{81}$
(E) $\sqrt{36}$
(D) $\sqrt{4}$
(H) $\sqrt{144}$
(N) $\sqrt{1}$
(C) $\sqrt{900}$
(H) $\sqrt{2,500}$
(U) $\sqrt{6,400}$
(D) $\sqrt{10,000}$
III. Simplify.
(E) $15^{2}$
(H) $11^{2}$
(A) $25^{2}$
(E) $\sqrt{121}$
(L) $\sqrt{625}$
(A) $\sqrt{16}+\sqrt{9}$
(E) $\sqrt{36}+\sqrt{64}$
(R) $\sqrt{25}-\sqrt{9}$
(N) $\sqrt{16+9}$
(T) $\sqrt{36+64}$
(L) $\sqrt{0.25}$
(B) $\sqrt{0.81}$
(J) $\sqrt{0.01}$

Answers for Part I and Part II


## Why Did the Teacher Assign Extra Homework When She Taught Adolescents?



Find which two consecutive whole numbers the square root is between. Write the letter of the exercise on the number line between these two numbers.

Use the top number line for the first set of exercises, and the bottom number line for the rest. .
(S) $\sqrt{30}$
(H) $\sqrt{2}$
(T) $\sqrt{45}$
(E) $\sqrt{8}$
(A) $\sqrt{23}$
(N) $\sqrt{120}$
(G) $\sqrt{138}$
(1) $\sqrt{82}$
(W) $\sqrt{11}$
(Y) $\sqrt{70}$
(S) $\sqrt{0.5}$
(B) $\sqrt{59}$

(S) $\sqrt{75}$
(D) $\sqrt{20}$
(O) $\sqrt{3}$
(A) $\sqrt{6}$
(E) $\sqrt{52}$
(S) $\sqrt{95}$
(O) $\sqrt{112}$
(N) $\sqrt{125}$
(D) $\sqrt{14}$
(T) $\sqrt{0.1}$
(A) $\sqrt{33}$
(L) $\sqrt{40}$


## Why Do Adults Complain So Much?

Find the length of the hypotenuse of each right triangle below. Find your answer in the answer column. Write the letter of the answer in the box containing the number of the exercise.

(2)

(3)


(5)

(8)

(11)

(14)


(12)
(15)


(R) $\sqrt{2,500}=50$
(S) $\sqrt{346} \approx 18.6$
(P) $\sqrt{89} \approx 9.4$
(L) $\sqrt{275} \approx 16.6$
(G). $\sqrt{65} \approx 8.1$
(A) $\sqrt{200} \approx 14.1$
(B) $\sqrt{269} \approx 16.4$
(A) $\sqrt{100}=10$
(E) $\sqrt{85} \approx 9.2$
(D) $\sqrt{562} \approx 23.7$
(Y) $\sqrt{169}=13$
(O) $\sqrt{130} \approx 11.4$
(U) $\sqrt{289}=17$
(T) $\sqrt{225}=15$
(H) $\sqrt{800} \approx 28.3$
(E) $\sqrt{25}=5$
(N) $\sqrt{580} \approx 24.1$
(13)


I DON'T LIKE THIS OR THAT ANO I DONTT...
(4)


| 5 | 9 | 1 | 11 | 3 | 13 | 6 | 10 | 15 | 2 | 8 | 12 | 14 | 4 | 7 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

TOPIC 6-b: The Rule of Pythagoras: Finding the Length of the Hypotenuse

## How Would You Describe a Dead Skunk?

Round each answer to the nearest tenth (if necessary). Find each answer at the bottom of the page and cross out the letter above it. When you finish, the answer to the title question will remain.
(1) Find the length of the hypotenuse of each right triangle.


B

C

(2) A rectangle is 6 m wide and 11 m long. How long is the diagonal of the rectangle?

11 m
6) Kristin and her family lefttheir campsite for a hike. They hiked 5 mi west and then 2 mi north. How far were they from the campsite?
(7) The window of a burning building is 40 feet above the ground. The base of a ladder is placed 9 feet from the building. How long must the ladder be to reach the window?

(8) The bases on a baseball diamond are 90 feet apart. How far is it from home plate to second base?
(9) The lawn in front of Pythagoras Jr. High is in the shape of a rectangle 24 m long and 10 m wide. How many meters shorter is your walk if you walk diagonally across the lawn rather than along two sides of it?

| D | E | S | A | X | D | T | N | O | 1 | S | N | T | A | C | K | T |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ம் | $\begin{aligned} & \text { D } \\ & \text { N் } \end{aligned}$ | $\begin{gathered} E \\ \stackrel{\rho}{n} \end{gathered}$ | $\underset{\infty}{ᄃ}$ | $\stackrel{\sim}{\tau}$ | $\begin{gathered} E \\ \stackrel{1}{\mathrm{i}} \end{gathered}$ | $\begin{aligned} & \dot{\vdots} \\ & \stackrel{\dot{N}}{\circ} \end{aligned}$ | $\overleftarrow{\forall}$ | $\begin{aligned} & \text { O} \\ & \text { N } \\ & \text { Ni } \end{aligned}$ | $\bar{E}$ | $\begin{aligned} & \pm \\ & \underset{\sim}{\top} \end{aligned}$ |  | $\begin{gathered} \stackrel{+}{N} \\ \underset{N}{N} \end{gathered}$ | $\begin{aligned} & \text { p } \\ & \lambda \\ & \underset{\sim}{\infty} \end{aligned}$ | $\begin{aligned} & \underset{\sim}{\dot{F}} \\ & \dot{\dot{+}} \end{aligned}$ |  | $\pm$ $\infty$ N N | $\stackrel{\text { ®ㅔN }}{ }$ |

## Cryptic Quiz

1. What is the opposite of a professional eater?

$$
\overline{8.8} \overline{19.6} \overline{18.5} \overline{8.8} \overline{10.9} \overline{8.8} \overline{3.3} \overline{9.8} \overline{70.7} \overline{1.4} \overline{70.7} \overline{14.5}
$$

2. How would you describe a job in the Acme Mitten Co. shipping department?

$$
\overline{22.4} \overline{16.1} \overline{19.2} \overline{5} \overline{19.6} \overline{6} \overline{68} \overline{6} \overline{8} \overline{16.1} \overline{9.2} \overline{70.7} \overline{6.3}
$$

3. What can be right but never wrong?

$$
\overline{8.8} \overline{19.6} \overline{7.4} \overline{8.8} \overline{19.6} \overline{6} \overline{8} \overline{70.7}
$$

For each exercise, find the missing length. (Refer to the diagram at the right.) Round your answer to the nearest tenth (if necessary) and find it in the code. Each time the answer appears, write the letter of the exercise above it.

(H) $a=9, b=4, c=$ $\qquad$ (ㄷ) $a=50, b=50, c=$ $\qquad$
(©) $a=8, b=14, c=$ $\qquad$ (B) $a=$ $\qquad$ , $b=20, c=30$
(S) $a=$ $\qquad$ , $b=3, c=7$
(V) $a=6, b=$ $\qquad$ , $c=11$
(M) $a=$ $\qquad$ $, b=5, c=12$
(W) $a=1, b=1, c=$ $\qquad$
(G) $a=$ $\qquad$ $, b=8, c=10$
(X) $a=$
$\qquad$ $, b=16, c=25$
(C) $a=5, b=$ $\qquad$ , $c=6$
(A) $a=2, b=$ $\qquad$ , $c=9$
(B) $a=4, b=$ $\qquad$ , $c=15$
(I) $a=12, b=\ldots, c=13$
(L) $a=$ $\qquad$ , $b=15, c=17$
(N) $a=10, b=$ $\qquad$ , $c=22$

## What Relation Is a Doorstep to a Doormat?

Round each answer to the nearest tenth (if necessary). Cross out the box containing each answer. When you finish, write the letters from the remaining boxes in the spaces at the bottom of the page.
(1) For each right triangle, find the length of the side that is not given.
A


B

C
7 in


D


F

(2) Yuki just bought a bigscreen TV set. The screen has a diagonal measure of 40 in . If the screen is 32 in . wide, how high is it?


32"
(3) A 25 -foot ladder is leaned against a wall. If the base of the ladder is 7 ft from the wall, how high up the wall will the ladder reach?
(4) Asr@segrsizammeter river, the current carried him 30 m downstream. How far did he swim?

@ The mast of a sailing ship is 20 ft tall. A rope is stretched 26 ft from the top of the mast to a cleat on the deck of the ship. How far is the cleat from the base of the mast?
6) Each side of an equilateral triangle measures 12 cm . Find the height, $\boldsymbol{h}$, of the triangle.

(7) Two jets left an airport at the same time. One traveled east at 300 miles per hour. The other traveled south at 400 miles per hour. How far apart were the jets at the end of an hour?

| $\begin{gathered} \mathrm{PL} \\ 85.4 \mathrm{~m} \end{gathered}$ | $\begin{gathered} \mathrm{DO} \\ 12 \mathrm{~cm} \end{gathered}$ | $\begin{gathered} \text { AS } \\ 9.8 \mathrm{~cm} \end{gathered}$ | $\begin{gathered} \text { OR } \\ 24 \mathrm{in} . \end{gathered}$ | $\begin{gathered} \mathrm{MA} \\ 500 \mathrm{mi} \end{gathered}$ | $\begin{gathered} \text { TE } \\ 26 \mathrm{in} . \end{gathered}$ | $\begin{gathered} \mathrm{AM} \\ 5.3 \mathrm{~cm} \end{gathered}$ | $\begin{gathered} \mathrm{RU} \\ 10.4 \mathrm{~cm} \end{gathered}$ | $\begin{gathered} \text { PF } \\ 520 \mathrm{mi} \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ON | AR | UN | PA | TH | IN | AT | ER | AN |
| 25.5 in. | 9.4 in. | 17.8 m | 16.6 ft | 87.1 m | 9.7 in . | 24 ft | 18.5 ft | 8.3 ft |

# What Does a BONE SPECIALIST Need to Get His Practice Started? 

Evaluate each formula below for the given values of the variables.
Find each answer at the left and cross out the letter next to it. When you finish, the answer to the title question will remain.

(1) $\boldsymbol{d}=\boldsymbol{r} \boldsymbol{w}$ where $\boldsymbol{d}$ is the distance traveled by an object moving at speed $\boldsymbol{r}$ in time $\boldsymbol{t}$. Find $\boldsymbol{d}$ if
$r=32 \mathrm{~m} / \mathrm{sec}, \mathrm{t}=8 \mathrm{sec}$.

(1) Identical cubes are stacked in the corner of a room as shown. How many cubes are there altogether?

(2) Make this equation correct by changing the position of only one digit.

$$
101-102=1
$$

(3) Ms. Smucker went to a store, spent half of her money and then $\$ 10$ more. She went to a second store, spent half of her remaining money and then $\$ 10$ more. But she then had no money left. How much money did she have to begin with?
(4) If 8 widgets equal 4 curlicues and 2 curlicues equal 3 goofups, then 16 widgets equal how many goofups?
(5) Draw the figure below without lifting your pencil from the page or tracing over a line previously drawn.


TOPIC 7-b: Test of Genius




Why Did the Brontosaurus Need Band-Aids?
For each exercise, circle the letter of the best estimate. Write this letter in the box



D-29 TCPC 3-e: Drawing Andes Wha Protractor

## Books Never Written



How to Lead the Band by


ABOVE ARE THE TITLES OF THREE "BOOKSNEVER WRITTEN."TO DECODE
THE NAMES OF THEIR AUTHORS:
Measure each angle below and find your answer in the code. Each time the answer
appears in the code, write the vertex letter of that angle above it. appears in the code, write the vertex letter of that angle above it.


Why Is a Party Like Pouring Oil Into a Car?.
Do each exerciseand find your answer at the bottom of the page. Write the letter of the exercisein the box above or below the answer.
I. Find the measure of the angle that is complementary to the angle having the measure given.
(E) $20^{\circ} 70^{\circ}$
(®) $\sigma 23^{\circ}$ (s)
(s) $176^{\circ}$
(E) $819^{\circ}$
(T) $45^{\circ} 45^{\circ}$
II. Find the measure of the angle that is supplementary to the angle having the measure given.
(B) $120^{\circ} 60^{\circ}$
(©) $56^{\circ} 124^{\circ}$ (1) $29^{\circ} 151^{\circ}$
(①) $162^{\circ} 18^{\circ}$ © $\left(83^{\circ} 97^{\circ}\right.$
III. Find the angle measure that is not given.


(F)




TOPIC 3.t Complementary anc Supplementary Anges D-30



## 

##  <br> 

What Is The Biggest Problem of Miners?




How Did the Judge Find Out About the Rotten Milk?
Do each exercise and find your answer in the Code Key. Notice the letter next to
the answer. Write this letter in the box containing the number tor the exercise.
I. Complete each statement.
(1) Two angles are complementary if the sum of their measures is $90^{\circ}$
(2) Two angles are supplementary if the sum of their measures is $180^{\circ}$
(3) The complement of a $30^{\circ}$ angle has a measure of $60^{\circ}$
(4) The supplement of a $65^{\circ}$ angla has a measure of $115^{\circ}$.
II. Find the measure of each numbered angle.

## What Do You Get When You..

1. Cross two ducks with a match?

Cross a stick of dynamite with a lemon pie?

Find the angle measures indicated. Look for each answer in the code. Each time the answer appears, write the letter of the exercise above it.

(1) $m \angle 8=57^{\circ}$

(a) $m \angle J=36^{\circ}$
(S) $m \angle W O X=18^{\circ}$

(E) $m \angle P Q T=67^{\circ}$
(1) $m \angle D A B=90^{\circ}$
(0) $m \angle D A C=34^{\circ}$


NOTE: Students are to assume that sides that appear parallel are parallel, and sides that appear to be perpendicular are perpendicular. Encourage students to write the name of each figure under it.

## Can a Polar Bear Go On a Safari?




Why Was Cinderella Kicked Offthe Baseball Team?
For each exercise, circle the letter of each figure that belongs in the categorynamed Arrange these letters to form a word. Then write this word on the line next to the name of the category.
(Youmay assume the following: sides that appear parallel are parallel: sides that appearperpendicularare perpendicular;sides that appear congruent are congruent.) 1 quadrilaterals:SHE

(4) hombuses: FROM

(5) squares: THE


TOPIC 3-1 Ouadrulaterals
D-38

ANSWERS
D-86

Why Didn't the Snobbish Potatoes Want Their Daughter to Marry a News Broadcaster?

Under each figure, circle the number-letter combinationnext to each word that
correctly names the figure. Write the letter in the matchingnumberedbox at the bottom of the page.
5. parallelogram 4-D rhombus

(6)




(10)
(4)



(12)


24-N parallelogram
 HE WAS JUST A COMMON TATER

D-39
TOPIC 3.1 Quadriaterals

## Why Do Ants Visit the Zoo on Cold Days?

Write the word missing from each statement in the boxes next to the statement Notice which letters are in numbered boxes. Write each of these letters in the matchingnumbered box at the bottom of the page.

with three sides
2 A polygon with four sides and four angles is a
-
A polygonwith five sides and
QUADRI LAPERAL five angles is a
4. A polygon with six sides and six angles is a
An octagon is a polygon with eight sides and eight $\qquad$
es and ten angles
A is a
is a
(7) In the set of figures above, Figure A is a
$B$ is an $\qquad$ -
(9) Figure C is a
(10) Figure D is a
(11) The point of intersectionof two sides of a polygonis calleda $\qquad$ $D E C A^{13} G O N$
$V R^{2}$
(12) A line segment (not a side) connecting two vertices of a polygon is called a
(13) A polygon with all sides the same length and all angles the same measure is
calleda__ polygon.

## 

TOPIC 3-m: Polygons D-40

NOTE: Part II of this puzzle introduces students to the concept of corresponding parts of congruent triangles.

Why Couldn't Orgo Buy a Round Trip Ticket?

II. Complete each statement, then find your answer in the answer column. Use the number of the exercise and the letter of the answer.



NOTE: This puzzle deals only with the congruence of angles in similar triangles. The proportionality of sides in similar figures is the topic of page E-12


| What Did the Waitress Mean When She Yelled to the Cook: $\text { " } 1+1 \text { "? }$ <br> Fill in each blank with one of the answers at the bottom of the page. Then write the letter of the exerciseabove its correct answer. answer. The figure at the right is a circle with center at $O$. <br> (E) The points on a circle are all the same distance from the center. <br> (S) A line segment from the center to any point on the circle is a cadius <br> (U) A line segment with both endpoints on the circle is a <br> (1) A chord that passes throughthe center of a circle is a diameter <br> (©) Adiameter of the circle in the drawing above is the segment $\overline{\mathbf{A C}}$. <br> (E) Which of the following is nota radius: $\overline{O A}, \overline{O D}$, or $\overline{B C}$ ? $\overline{B C}$ <br> (S) Which of the followingis nota chord: $\overline{B C}, \overline{O A}$, or $\overline{A C} ? \overline{O A}$ <br> (N) Part of a circle, such as between points $B$ and $C$, is an $\operatorname{ArC}$ <br> (E) An angle whose vertex is at the center of a circle is a central angle <br> (P) Which of the followingis nota central angle: $\angle A O D . \angle C O D$. or $\angle B C A$ ? BCA <br> (S) Points $A, B, C$, and Dare all the same distancetrom point $O$. <br> (O) If the length of $\overline{A C}$ is 20 cm , then the length of $\overline{O C}$ is 10 cm . <br> (N) If the length of $\overline{O A}$ is 20 cm , then the length of $\overline{O D}$ is 20 cm . <br> (W) If the length of $\overline{O D}$ is 20 cm , then the length of $\overline{A C}$ is 40 em . <br> (L) The length of a radius is half the length of a diameter. <br> (T) The set of points in a plane at a fixed distance from a given point is a circle. <br> D-43 | O. What Did the Secretary Say $\square$ 0 to Her Boy Friend? <br> For each exercise, circle the letter of each figure that is divided by a line of symmetry. Arrange these letters to form a word. Then write this word on the line next to the exercisenumber <br> (1) You <br> © $\qquad$ <br> (2) ARE <br> (3) JUST <br> (3) <br> (5) TYPE $\stackrel{0}{i+5}$ |
| :---: | :---: |
| NOTE: Encourage students to write the name of each figure under it. You and edges of each polyhedron. | Why Did the River Guide Carry a Rifle? $\qquad$ answer. When you finish, write the letters from the remainingboxes in the spacesat the bottom of the page. <br> (4) ${ }^{2.0 \mathrm{~km}}$ - <br>  <br> (13) Find the perimeter of a sheet of <br> (14) How many feet of border are needed to go around a square bulletin board |

## What Is the Title?

## TO FIND THE TITLE OF THIS

 PICTURE:Do each exercise below and find your answer in the code. Each time the answer appears, write the letter of the exercise above it.


CODED TITLE:

 I. Find the perimeter of each figure.
(O) Triangle with sides of 8.2 cm 3.9 cm . and 4.5 cm 16.6 cm Square with sides of 16.4 m 65.6 m
Parallelogramwith sides of 40 cm and 75 cm
(A) Regular decagon with sides
230 cm of 0.63 km km
B Rectangle with sides of 22 in. and 28 in
100 in
(1) Equilateral triangle with sides of 5.25 ft
15.75 H
H Regular hexagon with sides of 2.75 in.
16.5 in .
iI. Solve.
(L) The width of a large Americanflag is 8 H Its g g th is 5 tt more than its width. Find
its perimeter.
The perimeter of a square window is 360 cm . Find the length of one side.
A) A pennantis shaped like an isosceles triangle. The short side is 14 in . long and is halt the length of each longer side. Find the perimeterof the pennant

70 in.
(N) The width of a rectangular poster is 16 m Its length is twice its width. Find its perimeter.
(F) The perimeter of aring ide is 14 ter of a triangle is 38 ft . One How long is the thirdside?
(S) The longest side of a triangular sail is 9 m long. The second side is 1.5 m shorter than the longest side. The third side is half the length of the longest side. What is the

Why Did the Piano Player Bang Her Head Against the Keyboard?


| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $\mathbf{S}$ | $\mathbf{H}$ | $\mathbf{E}$ | $\mathbf{W}$ | $\mathbf{A}$ | $\mathbf{S}$ | $\mathbf{P}$ | $\mathbf{L}$ | $\mathbf{A}$ | $\mathbf{Y}$ | $\mathbf{1}$ | $\mathbf{N}$ | $\mathbf{G}$ | $\mathbf{B}$ | $\mathbf{Y}$ | $\mathbf{E}$ | $\mathbf{A}$ | $\mathbf{R}$ | SHE WAS PLAYING EYEAR TOPPC 4b Cincumierence $\quad$ D-48


for $\pi$.



 $660 \mathrm{~mm} 4 \frac{5}{7} \mathrm{in}$. The minute hand of a alrge clock
6 th long. How tar does the point
of the hand move in one hour?
$\mathbf{3 7 . 6 8 ~ f t}$ (1)
(3)
 (ㅇ) . each circlay
$=28$ in.
$88^{\text {in. }}$
$=3 i_{2}^{1}$
11
in.
have a $d=28$ in
88 in
 diameter of 27 in. Wiw
the e bicyclect travel witn
of the wheels? 84,78 $\equiv$ (ㅇ)

## What Does a Tuba Call Its Father?

Give the number of square units in each figure. Find your answer and cross out the letters above it. When you finish, the answer to the title question will remain.


14


$$
32
$$


$\stackrel{4}{4}$


46

7
15

$\square$ 20




TOPIC 4.c Area of Rectangles


## Why Do Elephants Have Ivory Tusks?

Do each exercise and find your answer in the answer columns. Write the letter of the answer in each box containing the number of the exercise.

## . Find the area of each figure


11. Find the area of the shaded region in each figure
(7) yard with sandbox

(10) A bedroom is 15 Rlong and 12 ft wide. How much will it cost to carpet the room
if carpeting costs $\$ 22$ per square yard?
(11) A rose gardenin the city park is rectangular and is 9 m wide if the area of the rectangleis $144 \mathrm{~m}^{2}$, what is the length of the garden? 16 .
( $1 \mathrm{yd}=3 \mathrm{ft}$ ) $\$ 440$ $\qquad$
$\begin{array}{lllll}\text { (A) } 219 \mathrm{ft}^{2} & \text { (T) } 68 \mathrm{in} .^{2} & \text { (U) } 251 \mathrm{ft}^{2} & \text { (G) } 124 \mathrm{~cm}^{2} & \text { (C) } 21 \mathrm{~m}^{2}\end{array}$ (N) $\$ 440$
(L) $20 \mathrm{~m}^{2}$ (F) $\$ 520$ (V) $108 \mathrm{in} .^{2}$ (E) $24 \mathrm{~m}^{2}$ (D) $88 \mathrm{tt}^{2}$ (P) 19 m
(I) $135 \mathrm{~cm}^{2}$ (S) $171 \mathrm{ft}^{2}$ (B) 16 m (B) $165 \mathrm{tt}^{2}$ (W) $119 \mathrm{in} .^{2}$ (O) $18 \mathrm{~m}^{2}$
 $30 \mathrm{ft} 171 \mathrm{ft}^{2}$

$\qquad$
$\qquad$


 THEY HAD THE SAME FAMILYTREE

## How Was the Wooden Marionette <br> Related to the Wooden Diving Board?

```
Use a calculatorto solve each problem (rounddecimal answers to the nearest tenth)
Find your answer in the answer column and notice the two letters next to it. Write
these letters in the spaces over the exercise number at the bottom of the page.
```

ORLD RECORD. The largest jigsaw puzzle ever made was 85 by Keene. New Hampshire
$\begin{array}{lc}2 \text { What was the area of the puzzle in in. } 2 \text { ? } & 673,200 \mathrm{in} .2 \\ 4.4 .4\end{array}$
3. What was the averagesize of each piece? 43.4 in. 2

WORLD RECORD: The world's largest quilt, designedby A Platteau. measures 69.6 by 99.5 R It was made from 16.140 equal-sized
$6,925,2 t^{2}$
,
6. What is the area of each square?

8 in. ${ }^{2}$
WORLD RECORD: The world's longest buffet table was $3,304.8 \mathrm{ft}$ long nd 8.2 tt wide. On June 19, 1982, approximately 4.000 people,
7. What was the area of the table?
$27,099.4 \pi^{2}$
and
1.7 H far apan were they sitting? isplayedon March 2,196 , and measures 411 by 210 .

0 . What is the area of the flag in $\mathrm{ft}^{2}$ ?

1. What is the area of the flag in $\mathbf{y d} \mathbf{d}^{2}$ ?
2. The fabric used for the flag weighs does the fla per yd. About how much does the flag weigh?

Answers
(HE) $997,228.8$
(OM) 46.5
(LY) 673.200
(TR) 15.344
(EY) 27.099 .4
${ }^{(0)}$
(SA) 86.310
(aid) 917.106 .8
(FA) 6,626
(ST) 14.904
(ge) 61.8
(v0) 4.835
(MII) 9.590
(EN) 83.820
(®) $28,186.4$

| What Happened to Mr. Meter When Mrs. Meter's Mother Flew in for a Visit? |
| :---: |
|  |

I. Find the PERIMETER and the AREA of each parallelogram.

II. Solve.
(7) The base of a parallelogramis 10 in . The height is 2 in . more than half the base. Find the area. 70 in. 2
(9) The area of a parallelogram is $60 \mathrm{sq} f$ The height is 5 tt . How long is the base? 12 ft
(8) The height of a parallelogramis 4.5 cm . The base is twice the height What is the area? $40.5 \mathrm{~cm}^{2}$
(10) The area of a parallelogramis $375 \mathrm{~cm}^{2}$ The base is 25 cm . Find the height. 15 cm


[^0]




D-94
MIDDLE SCHOOL MATH WITH PIZZAZZ! BOOK D
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## Cryptic Quiz

1. What is the opposite of a professional eater?
$\frac{A}{8.8} \frac{N}{19.6} \frac{A}{18.5} \frac{M}{10.9} \frac{A}{8.8} \frac{C}{3.3} \frac{H}{9.8} \frac{E}{70.7} \frac{W}{1.4} \frac{E}{70.7} \frac{R}{14.5}$
2 How would you describe a job in the Acme Mitten Co. shipping department? $\frac{\mathrm{B}}{22.4} \frac{\mathrm{O}}{16.1} \frac{\mathrm{X}}{19.2} \frac{\mathrm{I}}{5} \frac{\mathrm{~N}}{19.6} \frac{\mathrm{G}}{6} \frac{-}{68} \frac{\mathrm{G}}{6} \frac{\mathrm{~L}}{8} \frac{\mathbf{O}}{16.1} \frac{\mathrm{~V}}{9.2} \quad \mathbf{E} \quad \mathbf{S}$

3 What can be right but never wrong?


For each exercise, find the missing length. (Refer to the diagram at the right.) Round your answer to the nearesttenth if necessary) and find it in the code. Each time the answer appears, write the letter of the exercise aboveit.

(1) $a=9, b=4, c=9.8$
(E) $a=50, b=50, c=70.7$
(0) $a=8, b=14, c=16.1$
@ $a=\underline{6.3}, b=3, c=7$
(v) $a=6, b=-9.2, c=11$
(N1) $a=10.9, b=5, c=12$
(1) $a=1, b=1, c=1.4$
( $\otimes a=19.2, b=16, c=25$
(A) $a=2, b=8.8, c=$
(ㄴ) $a=\xrightarrow{8}, b=15, c=17$
(N) $a=10, b=19.6 . c=22$

(a) $a=6 \quad, \quad b=8, c=10$ $3.3, c=6$
(A) $a=4, b=14.5, c=15$
(1) $a=12 . b=5, c=13$

|  |  |
| :---: | :---: |
| What Does a BONE SPECIALIST Need to Get His Practice Started? |  |
| Evaluate each formula below for the given values of the variables Find each answer at the left and cross out the letter next toit. When you finish, the answer to the title question will remain. |  | where dis the distance traveled by an object moving $r=32 \mathrm{~m} / \mathrm{sec} t=8$.

256 m


| (2) $E=I R$ | where $E$ is the voltage in an electric circuit with curren land resistance $\boldsymbol{R}$. Find E if |
| :---: | :---: |
|  | $1=2.5$ amperes, $R=60$ ohms. 150 V |
| (3) $v=9.8 t$ | where $v$ is the speed in meters per second of a freefalling object after tseconds. Find vif |
|  | $\mathrm{t}=5 \mathrm{sec} . \quad 49 \mathrm{~m} / \mathrm{sec}$ |
| (4) $S=\left(n^{-2}\right) 180$ | where $\boldsymbol{S}$ is the sum of the measures of the angles of a polygon with n sides. Find Sif |
|  | $n=8 . \quad 1,080$ |

$\begin{array}{ll}\text { (5) } A=6 \theta^{2} & \begin{array}{l}\text { where } A \text { is the surface area of a cube with edge } \theta \text {. } \\ \text { Find } A \text { if }\end{array}\end{array}$
$\theta=12 \mathrm{~cm}$. of side $W$ is the volume of a prism win $h=10 \mathrm{~cm}, w=7 \mathrm{~cm}$.
$\qquad$ a car traveling at $\boldsymbol{s}$ miles per hour. Find Lif

$C=20^{\circ}$.
$68^{\circ} \mathrm{F}$
(9) $-4(220-\mathrm{n})$ where B is the recommendedmaximum heart rate where Bis the recommendedmaximum heart rate
during exercise for a person y years old. Find B if $y=15$.
beats/sec

D-77
7-a:Formulas

What Relation Is a Doorstep to a Doormat?
Round each answer to the nearest tenth (if necessary). Cross out the box containing each answer. When you finish, write the letters from the remainingboxes in the spaces at the bottom of the page.

(2) Yuki ijst bought a a gig. screen TV set. The screen has a diagonal
measure of 40 in if the measure of 40 in if the screen is 32 in. wide.
how high is it? 24

(3) $A$ 25-foot lacdod is is leaned againsta wall: the base of the ladoer is 2 thtom the wall. how high up the wall willinq 'qiffer reach?
(4) As Greg swam across an 80 -meter river, the current carried him 30 m downstream. How tar

(5) The mast of a sailing ship is 20 tt tall. A rope is stretched 26 t trom the top $d$ the mast to a cleat on the deck of the ship.
How far is the cleat from the base of the mast? 16.6 ft
(6) Each side of an equilateral triangle measures 12 cm . Find the height, $h$. of the triangle. 10.4 em6 6
(7) Two jets left an airport at the same time One traveled east at 300 miles per hour. The other traveled south at 400 miles per hour. How far apart were the jets at the
end of an hour? 500 mi end of an hour? 500 m



(1) Identicalcubes are stackedin the comer of aroom as shown. How many cubes are there altogether? 20

(2) Make this equation correct by changing the postion of only one digtt.

## $101^{101-102}=1$

(3) Ms. Smucker went to a store, spent hal of her money and then $\$ 10$ more. She went to a second store, spent half of her remaining money and then $\$ 10$ begin with? $\$ 60$
(4) If 8 widgets equal 4 curlicues and 2 curlicues equal 3 gootups, then 16 widgets equal/how many gootups?
(5) Draw the figure below without lifting your pencil fromthe page or tracing

(6) Steven has 9 gold coins that are identical in appearance. However, one coin is counterfeit and weighs slightly less than the others. Using a balance scale, how can he find the counterf coin in just two weighings?

(7) In the following addition problem, the letters A, B, and C stand for three
different digits. What digit should different digits. What digit should
replace each letter? replace each letter?

| $A B C A=4$ |
| ---: |
| $+A C B B=5$ |
| $C B A$ |

(B) The teacher noticed there we $n$ fewer than 100 students on the playground When she countedthem by 2s. there was 1 studentleft over. In fact, when Me counted them by 3 s . 4 s . 5 s , or 6 s .
there was always 1 student left over. there was always 1 studentleft over
How many studentswere on the playground?
(9) In the Hope family there are seven sisters, and each sister has one brother. Including Mr. and Mrs. Hope how many are in the family? 10

## SCORING KEY

8 or 9 - Superstar Genius
8 or 9 - Superstar
6 or 7 - Star Genius
4 or 5 - Genius
3 or less - Genius of the Future
D.78


[^0]:    TOPIC 4-: Area of Parallelograms D-54

