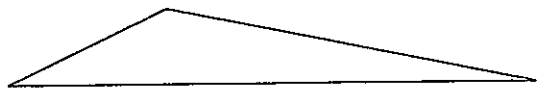
Date Time

# Math Boxes 10.1

1. Measure the base and height of the triangle below to the nearest centimeter.

The base is about _____ cm.

The height is about _____ cm.



Find the area of the triangle to the nearest square centimeter.

$$\text{Area} = \frac{1}{2} * b * h$$

The area is about _____ $cm^2$.

SRB 177

2. Insert parentheses to make each number sentence true.

a. $7 * 2 + 18 = 140$

b. $98 = 18 / 9 * 49$

c. $27 = 45 / 5 * 3$

d. $6 * 7 - 6 = 6$

e. $45 / 5 * 3 = 3$

SRB 203

3. Name a number between each pair of numbers.

a. 4.2 and 4.25 _____

b. $\frac{3}{8}$ and $\frac{3}{7}$ _____

c. $-12$ and $-11$ _____

d. $\frac{1}{10}$ and 0.15 _____

e. $\frac{2}{3}$ and $\frac{5}{6}$ _____

f. $\frac{7}{16}$ and $\frac{4}{5}$ _____

SRB 32–33 66–67

4. Estimate the answer for each problem. Then solve the problem.

| | Estimate | Solution |
|---|---|---|
| a. $302 * 57$ | _____ | _____ |
| b. $599 * 9$ | _____ | _____ |
| c. $701 * 97$ | _____ | _____ |
| d. $498 * 501$ | _____ | _____ |

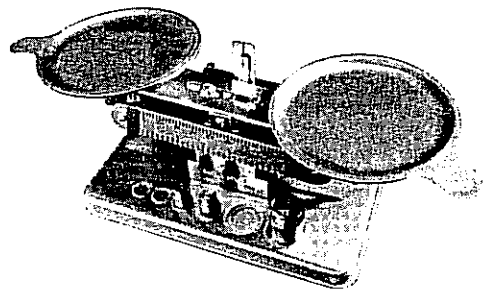
SRB 18 19 227

Date Time

# Pan-Balance Problems

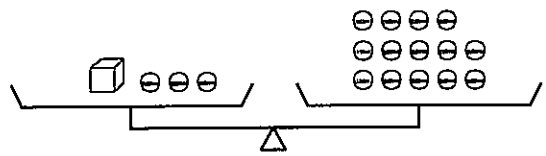
## Math Message

1. How would you use a pan balance to weigh an object?

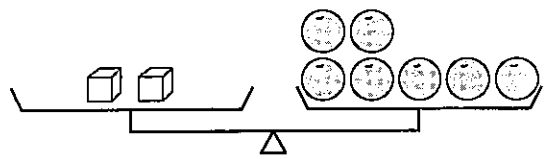


Solve these pan-balance problems. In each figure, the two pans are in perfect balance.

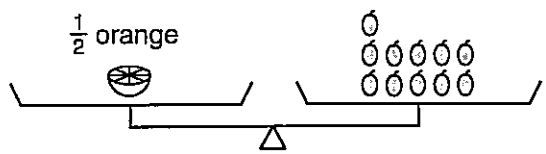
2. One cube weighs as much as _____ marbles.



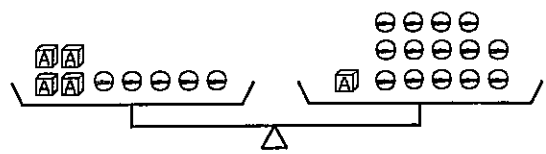
3. One cube weighs as much as _____ oranges.



4. One whole orange weighs as much as _____ grapes.




5. One block weighs as much as _____ marbles.



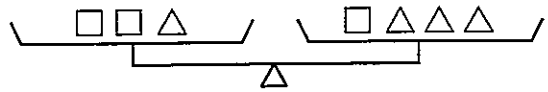
Check your answers. The sum of the answers to Problems 2–5 should equal $39\frac{1}{2}$.

Date Time

# Pan-Balance Problems (cont.)

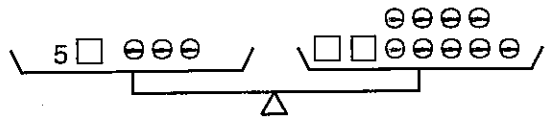
6. One □ weighs

   as much as _____ △s.



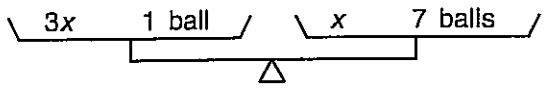
7. One □ weighs

   as much as _____ marbles.



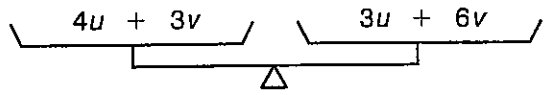

8. One $x$ weighs

   as much as _____ balls.




9. One $u$ weighs

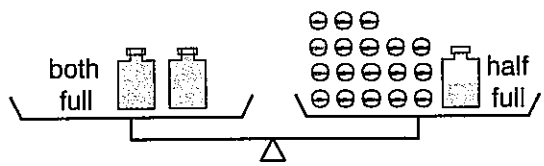
   as much as _____ $v$s.




Check your answers: The sum of the answers to Problems 6–9 should equal 10.

## Challenge

10. An empty bottle weighs as much as 6 marbles.




   a. The content of a full bottle weighs

      as much as _____ marbles.

   b. A full bottle weighs as much as _____ marbles.


### Housing Boom

Some might say that Parker Brothers (the games company) has built more houses than any other developer in the world. Since 1935, the company has "built" more than 3 billion houses for its Monopoly® game.

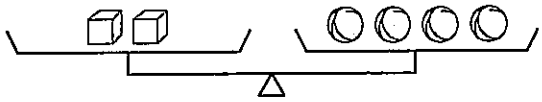
*Source: Games Magazine*

Date Time

# More Pan-Balance Problems

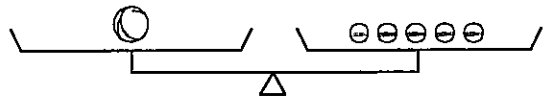
Solve these problems, using both pan balances in each problem. In each problem, the pans are in perfect balance. The weights of objects, such as blocks, balls, marbles, and coins, may be different from problem to problem, but are consistent within each problem.

**1.**



One block weighs

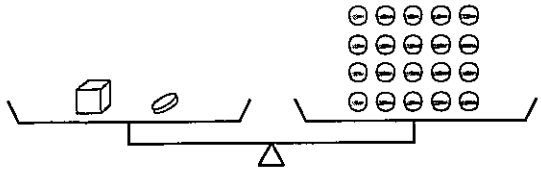
as much as _____ marbles.



One ball weighs

as much as _____ marbles.

**2.**



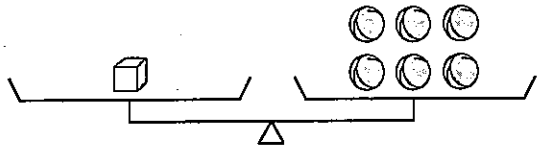
One block weighs

as much as _____ marbles.

One coin weighs

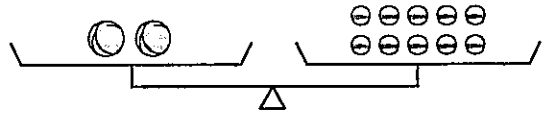
as much as _____ marbles.

**3.**



One block weighs

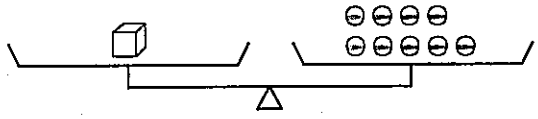
as much as _____ marbles.



One ball weighs

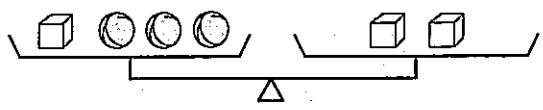
as much as _____ marbles.

**4.**



One block weighs

as much as _____ marbles.



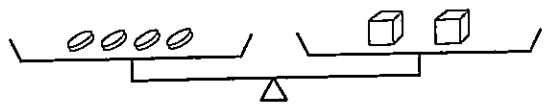
One ball weighs

as much as _____ marbles.

Date Time

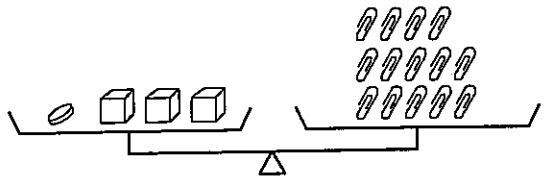
# More Pan-Balance Problems (cont.)

5.



One coin weighs

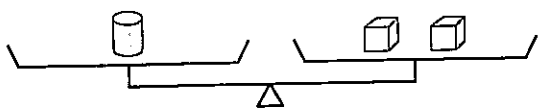
as much as _____ clips.



One block weighs

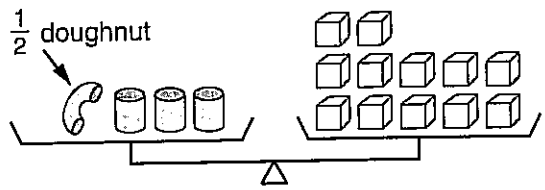
as much as _____ clips.

6.



One can weighs

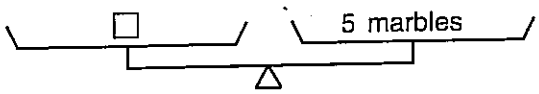
as much as _____ blocks.




One doughnut weighs

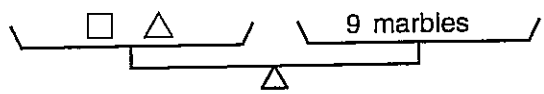
as much as _____ blocks.

7.




One □ weighs

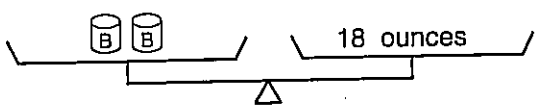
as much as _____ marbles.




One △ weighs

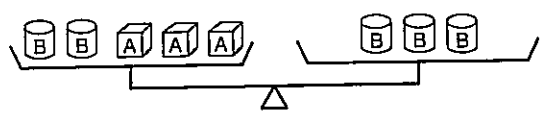
as much as _____ marbles.

8.




Each can weighs *B* ounces.

*B* = _____ ounces



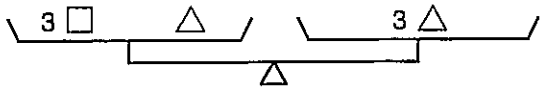

Each cube weighs *A* ounces.

*A* = _____ ounces

Date Time

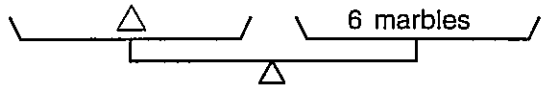
# More Pan-Balance Problems (cont.)

**9.**




One □ weighs

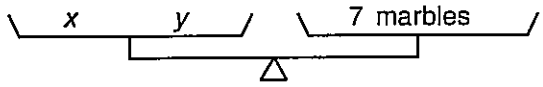
as much as _____ marbles.




One △ weighs

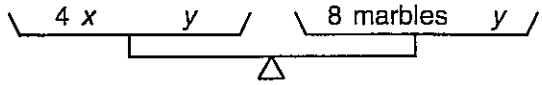
as much as _____ marbles.

**10.**




*y* weighs

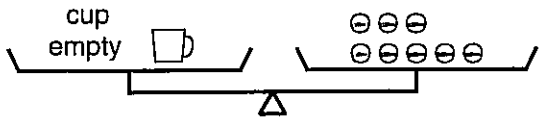
as much as _____ marbles.

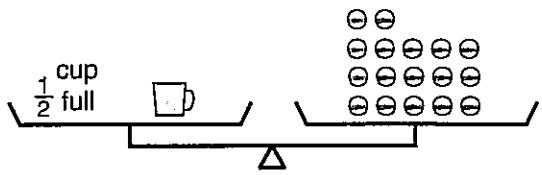



*x* weighs

as much as _____ marbles.

**11.**



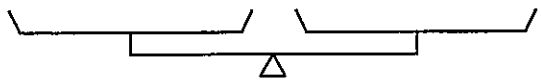

If the cup is full, **the coffee in the cup** weighs as much as _____ marbles.

If the cup is full, **the coffee plus the cup** weighs as much as _____ marbles.

**12.** Two pens weigh as much as one compass. One pen and one compass together weigh 45 grams.

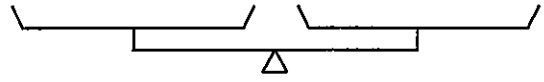
Complete the pan-balance sketches below. Find the weight of one pen and of one compass.

**a.**



One pen weighs _____ grams.

**b.**



One compass weighs _____ grams.

Date Time

# Represent Number Stories

Circle each expression that correctly represents the information in the story.
(There may be more than one answer.)

1. Melissa baked 5 trays with 12 cookies each. She sold 3 trays of 12 cookies.

   **Number of cookies sold:**

   $(5 - 3) * 12$ $3 * 12$ $5 * 12$

2. Jonas was stocking up on soda for the family. He bought 8 six-packs of soda. His mom bought 3 more six-packs.

   **Total number of cans of soda:**

   $(8 * 3) + 6$ $(8 * 3) + (8 * 6)$ $6 * (8 + 3)$

3. Jenny bought 6 envelopes for 14 cents each and 6 stamps for 34 cents each.

   **Amount of money spent:**

   $(6 + 6) * (14 + 34)$ $(6 * 14) + (6 * 34)$ $6 * (14 + 34)$

4. Monty had 8 packages of 12 pencils when the year started. He used 3 packages of 12 during the school year.

   **Number of pencils left:**

   $(8 - 3) * 12$ $(8 * 12) - (3 * 12)$ $(8 + 3) * 12$

5. Make up one of your own.

   _____

   _____

   _____

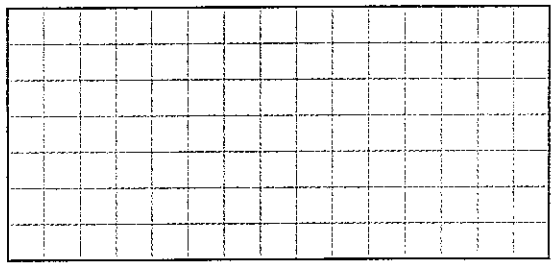
   **Your number expression:** _____

Date Time

# Math Boxes 10.2

1. Draw a figure on the grid that has a perimeter of 32 units.

1 unit



SRB 170

2. Solve.

Solution

a. $\frac{5}{9} = \frac{x}{18}$ _____

b. $\frac{8}{25} = \frac{40}{y}$ _____

c. $\frac{6}{14} = \frac{w}{49}$ _____

d. $\frac{28}{z} = \frac{7}{9}$ _____

e. $\frac{44}{77} = \frac{4}{v}$ _____

SRB 100-101

3. a. Make up a set of 15 numbers that has the following landmarks.

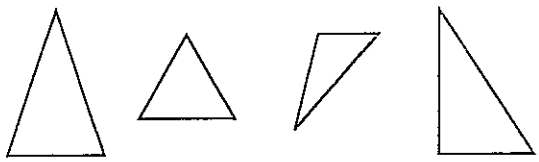
Maximum: 152
Range: 25
Mode: 139
Median: 142

b. Make a stem-and-leaf plot of the data.

| Stems (10s) | Leaves (1s) |
|---|---|
| | |

SRB 112-113

4. Circle any triangles that look like equilateral triangles.



Write a definition of an equilateral triangle.

_____

_____

_____

SRB 134

5. Divide or multiply mentally.

a. 246 / 6 = _____

b. 108 / 4 = _____

c. 299 * 15 = _____

d. 35 * 22 = _____

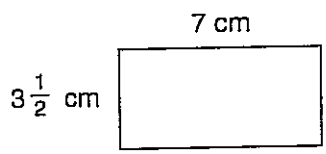
e. 50 * 27 = _____

SRB 18 21

Date Time

# Math Boxes 10.3

**1.** Find the area and perimeter of the rectangle.




Area = _____ (unit)

Perimeter = _____ (unit)

**2.** Insert parentheses to make each number sentence true.

**a.** 6 + 8 * 10 = 140

**b.** 21 = 42 / 6 − 4

**c.** 7 * 7 + 2 = 63

**d.** 3 * 15 − 3 = 36

**e.** 42 / 6 − 4 = 3

**3.** Name a number between each pair of numbers.

**a.** −1.30 and −1.20 _____

**b.** 8.05 and 8.10 _____

**c.** −0.26 and −0.25 _____

**d.** $\frac{1}{3}$ and $\frac{7}{8}$ _____

**e.** $\frac{1}{4}$ and 0.3 _____

**f.** 0.2 and $\frac{2}{9}$ _____

**4.** Estimate the answer for each problem. Then solve the problem.

| | Estimate | Solution |
|---|---|---|
| **a.** 60.3 * 71 | _____ | _____ |
| **b.** 29 * 0.8 | _____ | _____ |
| **c.** 48 * 2.02 | _____ | _____ |
| **d.** 2.2 * 550 | _____ | _____ |

Date Time

# Algebraic Expressions

Complete each statement below with an algebraic expression, using the suggested variable. The first problem has been done for you.

1. If Beth's allowance is $2.50 more than Ann's, then Beth's allowance is

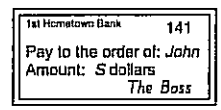
   D + $2.50 .

Ann's allowance is *D* dollars.

Beth

2. If John gets a raise of $5 per week, then his salary is

   $ _____.




John's salary is *S* dollars per week.

3. If Ali's grandfather is 50 years older than Ali, then Ali is

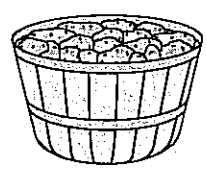
   _____ years old.

Ali's grandfather is *G* years old.

Ali

4. Seven baskets of potatoes weigh

   _____ pounds.

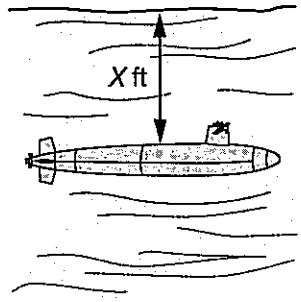


A basket of potatoes weighs *P* pounds.

Date Time

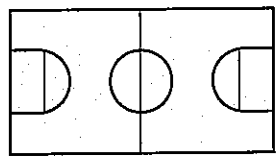
# Algebraic Expressions (cont.)

5. If a submarine dives 150 feet, then it will be traveling at a depth of _____ feet.



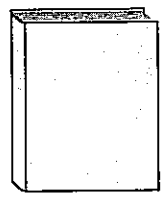

A submarine is traveling at a depth of $X$ feet.

6. The floor is divided up for gym classes into 5 equal-sized areas. Each class has a playing area of _____ $ft^2$.



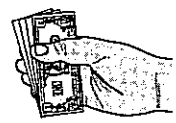
The gym floor has an area of $A$ square feet.

7. The charge for a book that is $D$ days overdue is _____ cents.



A library charges 10 cents for each overdue book. It adds an additional charge of 5 cents per day for each overdue book.

8. If Kevin spends $\frac{2}{3}$ of his allowance on a book, then he has _____ dollars left.



Kevin's allowance is $X$ dollars.

Date Time

# "What's My Rule?"

1. a. State in words the rule for the "What's My Rule?" table at the right.

| X | Y |
|---|---|
| 5 | 1 |
| 4 | 0 |
| −1 | −5 |
| 1 | −3 |
| 2 | −2 |

b. Circle the number sentence that describes the rule.

$Y = X / 5$ $Y = X - 4$ $Y = 4 - X$

2. a. State in words the rule for the "What's My Rule?" table at the right.

| Q | Z |
|---|---|
| 1 | 3 |
| 3 | 5 |
| −4 | −2 |
| −3 | −1 |
| −2.5 | −0.5 |

b. Circle the number sentence that describes the rule.

$Z = Q + 2$ $Z = 2 * Q$ $Z = \frac{1}{2}Q * 1$

3. a. State in words the rule for the "What's My Rule?" table at the right.

| g | t |
|---|---|
| $\frac{1}{2}$ | 2 |
| 0 | 0 |
| 2.5 | 10 |
| $\frac{1}{4}$ | 1 |
| 5 | 20 |

b. Circle the number sentence that describes the rule.

$g = 2 * t$ $t = 2 * g$ $t = 4 * g$

Date Time

# Multiplication and Division Practice

Solve. Show your work in the space below the problems.

1. $384 * 1.5 =$ _____

2. $50.3 * 89 =$ _____

3. $824 * 75 =$ _____

4. $\frac{843}{7} =$ _____

5. $70.4 / 8 =$ _____

6. $1{,}435 / 0.5 =$ _____

Date Time

# Speed and Distance

## Math Message

1. A plane travels at a **speed** of 480 miles per hour. At that rate, how many miles will it travel in 1 minute? Write a number model to show what you did to solve the problem.

   Number model: _____ Distance per minute: _____ miles

---

## Rule for Distance Traveled

2. For an airplane flying at 8 miles per minute (480 mph), you can use the following rule to calculate the distance traveled for any number of minutes:

   Distance traveled = 8 * number of minutes
   or
   $d = 8 * t$

   where $d$ stands for the distance traveled and $t$ for the time of travel, in minutes. For example, after 1 minute, the plane will have traveled 8 miles (8 * 1). After 2 minutes, it will have traveled 16 miles (8 * 2).

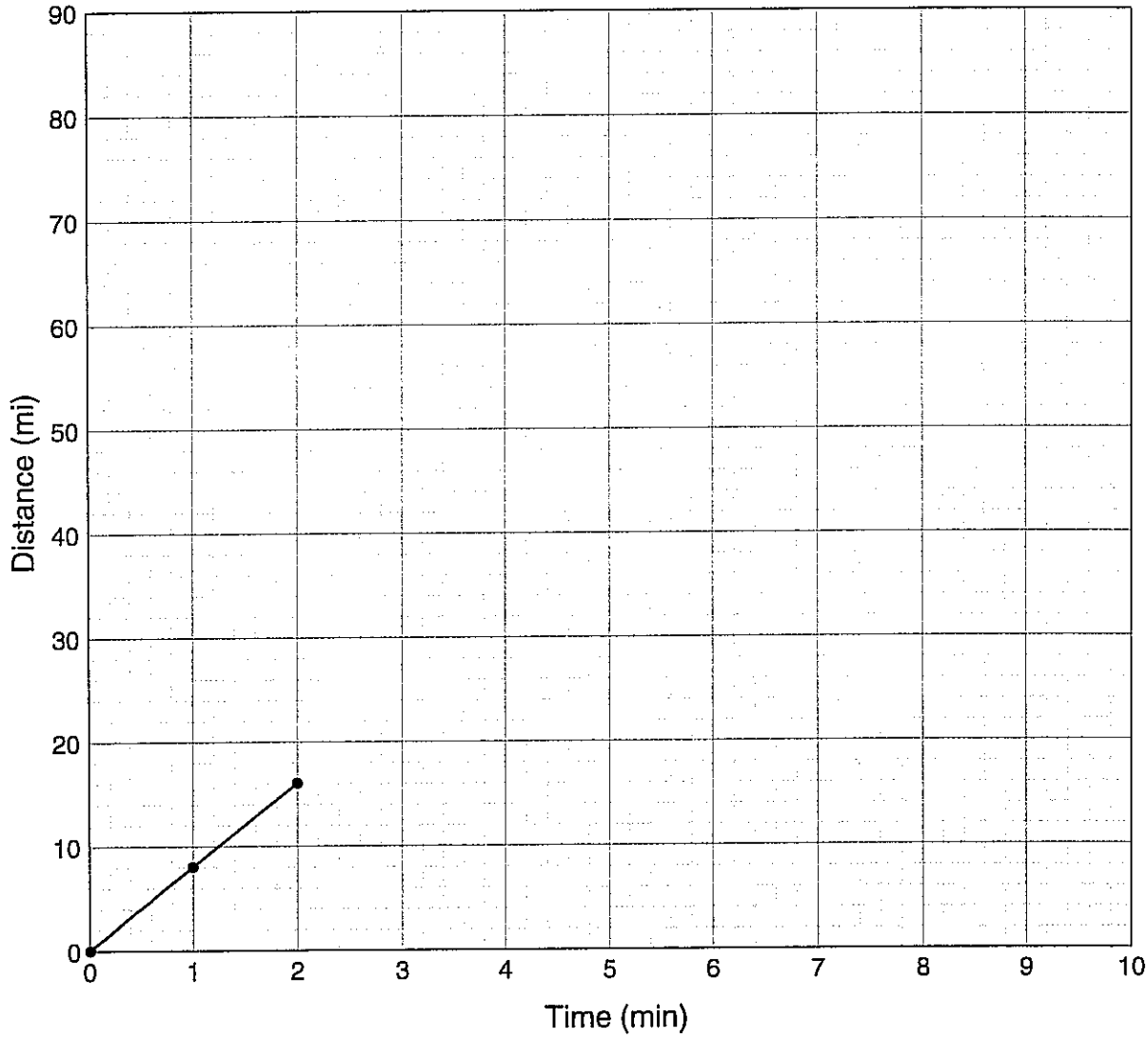
3. Use the rule $d = 8 * t$ to complete the table at the right.

| Time (min) ($t$) | Distance (mi) ($8 * t$) |
|---|---|
| 1 | 8 |
| 2 | 16 |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| 10 | |

Date Time

# Speed and Distance (cont.)

4. Complete the graph using the data in the table on page 354. Then connect the dots.




Use your graph to answer the following questions:

5. How far would the plane travel in $1\frac{1}{2}$ minutes? _____ (unit)

6. How many miles would the plane travel in 5 minutes 24 seconds (5.4 minutes)? _____ (unit)

7. How long would it take the plane to travel 60 miles? _____ (unit)

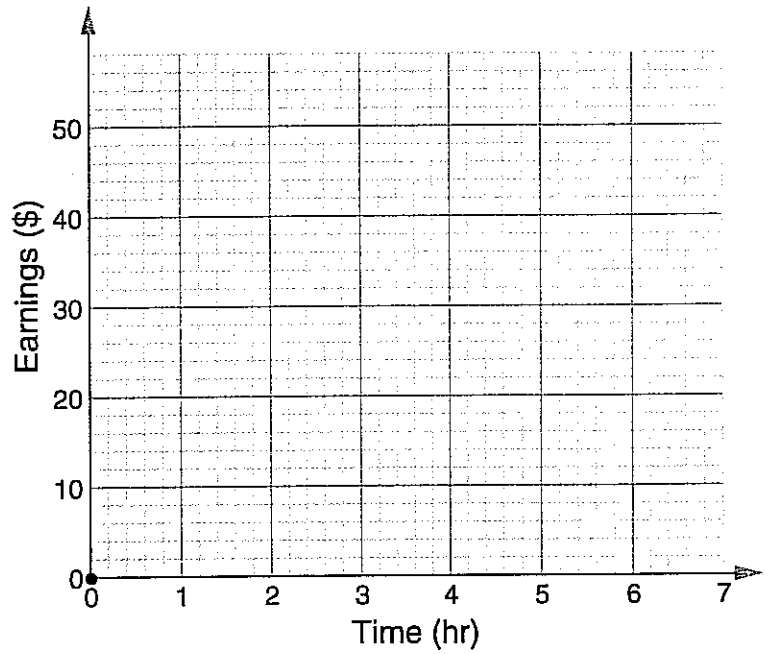
Date Time

# Representing Rates

Complete each table below. Then graph the data and connect the points.

1. a. Andy earns \$8 per hour. Rule: Earnings = \$8 * number of hours worked

| Time (hr) ($h$) | Earnings (\$) ($8 * h$) |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| | 40 |
| 7 | |

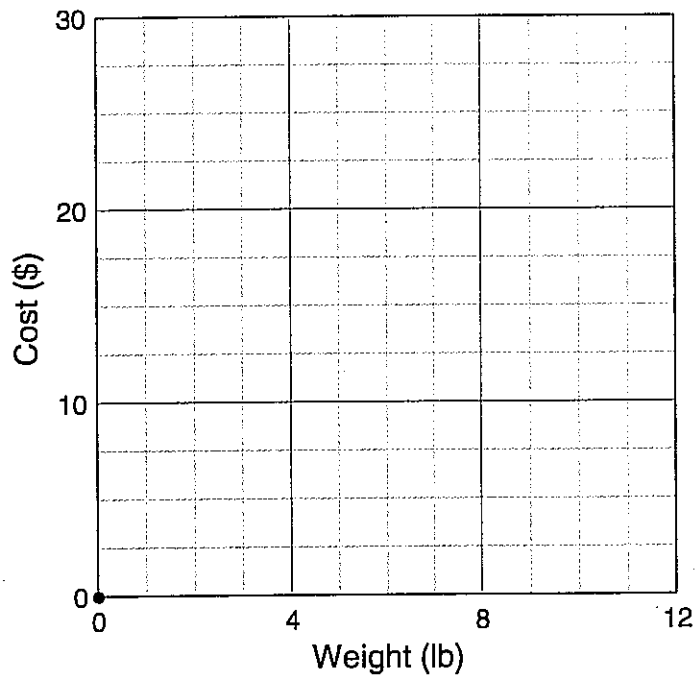



b. Plot a point to show Andy's earnings for $5\frac{1}{2}$ hours. How much would he earn?

_____

2. a. Red peppers cost \$2.50 a pound. Rule: Cost = \$2.50 * number of pounds

| Weight (lb) ($w$) | Cost (\$) ($2.50 * w$) |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| | 15.00 |
| 12 | |




b. Plot a point to show the cost of 8 pounds. How much would 8 pounds of red peppers cost?

_____

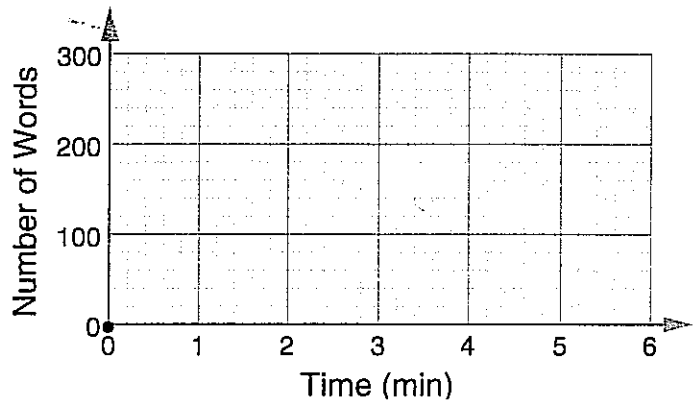
Date Time

# Representing Rates (cont.)

3. a. Frank types an average of 45 words a minute.

Rule: Words typed = 45 * number of minutes

| Time (min) ($t$) | Words ($45 * t$) |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| | 225 |
| 6 | |



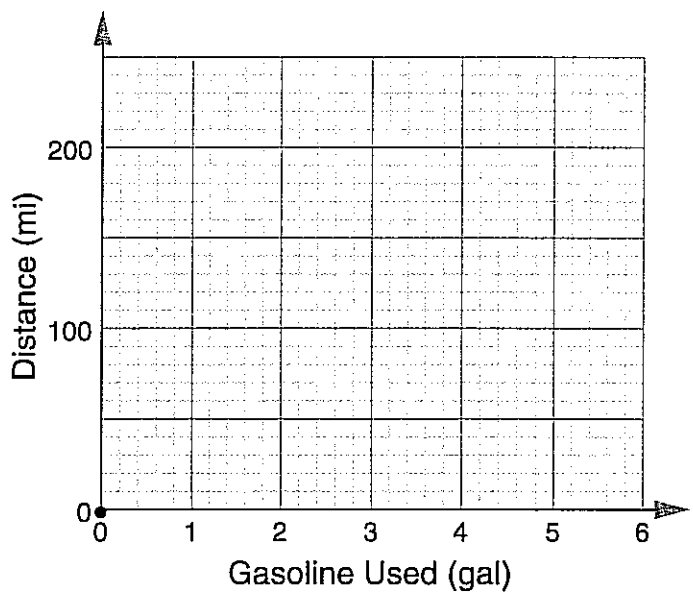

b. Plot a point to show the number of words Frank types in 4 minutes. How many words is that?

_____

4. a. Joan's car uses 1 gallon of gasoline every 28 miles.

Rule: Distance = 28 * number of gallons

| Gasoline (gal) ($g$) | Distance (mi) ($28 * g$) |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| | 140 |
| $5\frac{1}{2}$ | |




b. Plot a point to show how far the car would travel on 1.4 gallons of gasoline. How many miles would it go?

_____

Date Time

# Area and Volume Review

## Area and Volume Formulas

**Area of rectangles and parallelograms**

$A = b * h$, where $A$ is the area, $b$ is the length of the base, and $h$ is the width or height

**Area of triangles**

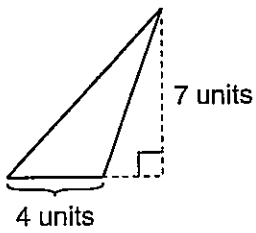
$A = \frac{1}{2} * b * h$, where $A$ is the area, $b$ is the length of the base, and $h$ is the height

**Volume of prisms**

$V = B * h$, where $B$ is the area of the base and $h$ is the height

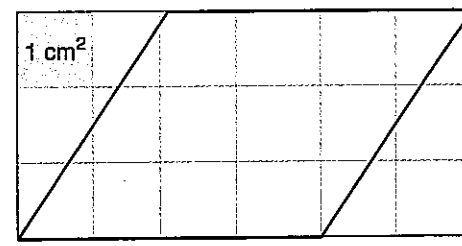
Find the area of these figures.

1.




Area: _____

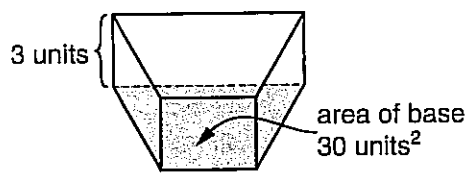
2.




Area: _____

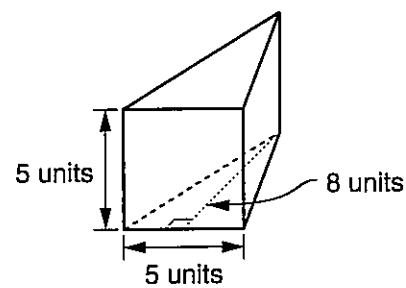
Find the volume of these solids.

3.



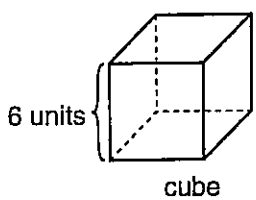

Volume: _____

4.



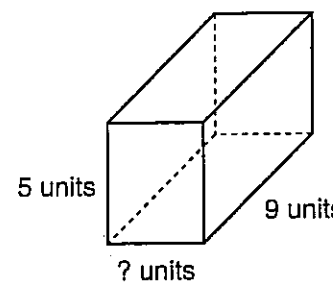

Volume: _____

5.




Volume: _____

6.



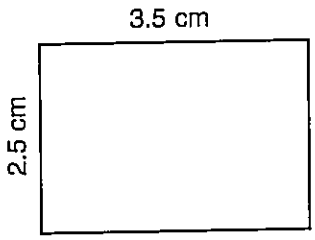

The volume of this prism is 180 cubic units. What is the width of its base?

_____

Date Time

# Math Boxes 10.4

1. Draw a rectangle whose perimeter is the same as the perimeter of the rectangle shown but whose sides are not the same length as those shown.




What is the area of the figure you drew?

_____

2. Solve.

Solution

a. $\frac{m}{10} = \frac{45}{50}$ _____

b. $\frac{56}{64} = \frac{7}{n}$ _____

c. $\frac{k}{48} = \frac{3}{8}$ _____

d. $\frac{4}{30} = \frac{12}{p}$ _____

e. $\frac{2}{18} = \frac{a}{180}$ _____

3. Make a stem-and-leaf plot of the following numbers:

120, 111, 137, 144, 121, 120, 95, 87, 120, 110, 135, 90, 86, 137, 144, 121, 120, 95, 87, 120, 110, 135, 90, 86, 143, 95, 141

| **Stems** (10s) | **Leaves** (1s) |
|---|---|
| | |

Find the landmarks.

Mode: _____

Median: _____

Range: _____

4. Draw an isosceles triangle.

Write a definition of an isosceles triangle.

_____

_____

_____

5. Divide or multiply mentally.

a. 495 / 5 = _____

b. 199 * 36 = _____

c. 63 * 500 = _____

d. 25 * 96 * 4 = _____

e. 843 / 3 = _____

Date Time

# Predicting When Old Faithful Will Erupt Next

Old Faithful Geyser in Yellowstone National Park is one of nature's most impressive sights. Yellowstone has 200 geysers and thousands of hot springs, mud pots, steam vents, and other "hot spots"—more than any other place on Earth. Old Faithful is not the largest or tallest geyser in Yellowstone, but it is the most dependable geyser. Using the length of time of an eruption, park rangers can predict when the next eruption will begin.

Old Faithful erupts at regular intervals that are **predictable.** If you time the length of one eruption, you can **predict** about how long you must wait until the next eruption. Use this formula:

Waiting time = (10 * (length of eruption)) + 30 minutes

$W = (10 * E) + 30$

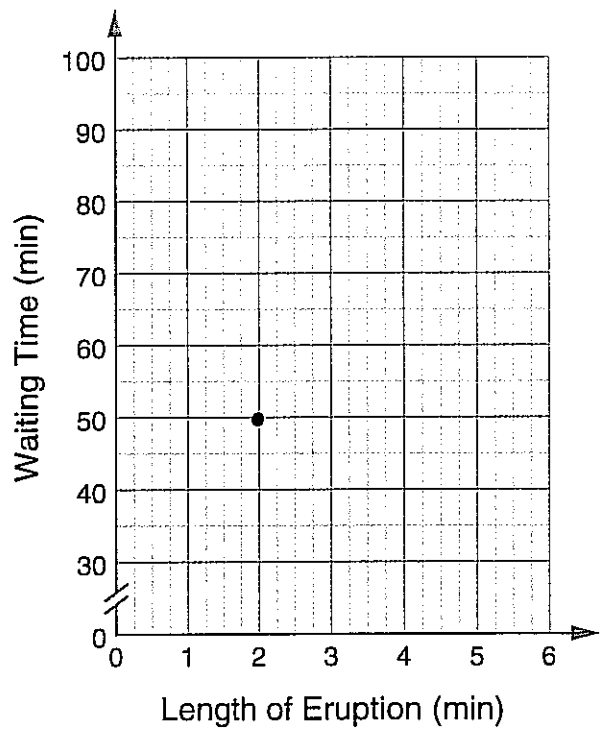
or $W = 10E + 30$

All times are in minutes.

1. Use the formula to complete the table below.

| Length of Eruption (min) ($E$) | Waiting Time to Next Eruption (min) ($(10 * E) + 30$) |
|---|---|
| 2 min | 50 min |
| 3 min | _____ min |
| 4 min | _____ min |
| 5 min | _____ min |
| 1 min | _____ min |
| $2\frac{1}{2}$ min | _____ min |
| 3 min 15 sec | _____ min |
| _____ min | 45 min |

2. Graph the data from the table. One number pair has been plotted for you.




3. It's 8:30 A.M., and Old Faithful has just finished a 4-minute eruption. About when will it erupt next?

_____

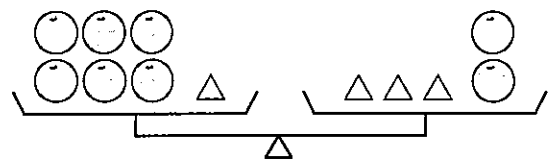
4. The average time between eruptions of Old Faithful is about 75 minutes. So the average length of an eruption is about how many minutes?

_____

Date Time

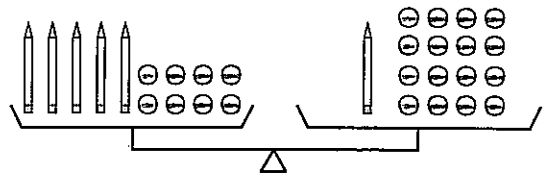
# More Pan-Balance Practice

Solve these pan-balance problems. In each figure, the two pans are in perfect balance.

1. 

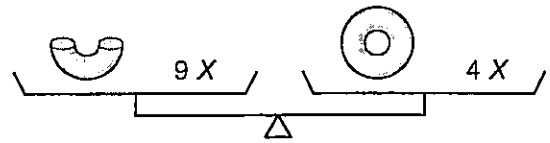
One orange weighs

as much as _____ triangle.

2. 

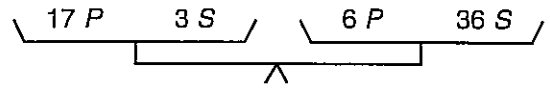
One marble weighs

as much as _____ pencil.

3. 

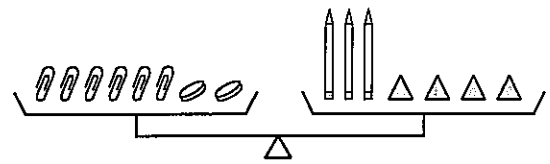

One doughnut weighs

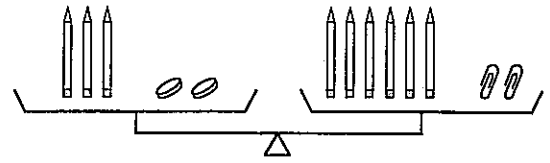
as much as _____ *X*s.

4. 


One *S* weighs

as much as _____ *P*.

5. 



One triangle weighs as much as _____ paper clips.

Explain how you found your answer. _____

_____

_____

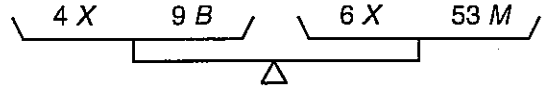
_____

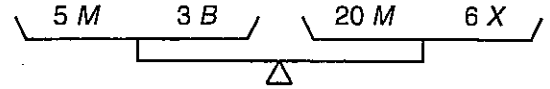
_____

_____

_____

_____

6. 


One *X* weighs as much as _____ *M*.

Date Time

# Math Boxes 10.5

1. Use your Geometry Template to trace three kinds of triangles in the space below. Under each triangle, write what kind of triangle it is.

SRB 134

2. Add or subtract.

   a. $-7 + (-3) =$ _____

   b. $5 - (-8) =$ _____

   c. $-17 + 10 =$ _____

   d. $-15 - 15 =$ _____

   e. $3 + (-20) =$ _____

SRB 92–94

3. List all of the factors for 48.

_____

_____

SRB 10

4. Add or subtract.

   a. $\frac{4}{5} + 1\frac{3}{8} =$ _____

   b. $1\frac{2}{4} - \frac{4}{5} =$ _____

   c. $6\frac{3}{7} - 3\frac{1}{3} =$ _____

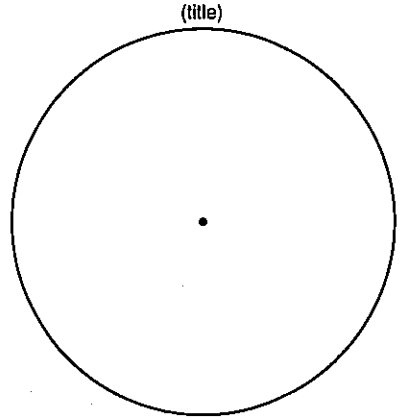
   d. _____ $= 4\frac{2}{9} + \frac{23}{6}$

SRB 70–72

5. The table shows how Robert spent his allowance for the month of April. Complete the table and make a circle graph of the data.

| Type of Expense | Amount Spent | Percent of Allowance |
|---|---|---|
| Snacks | $2.50 | |
| Movie | $5.50 | |
| Gum | $0.50 | |
| Baseball Cards | $1.50 | |
| Total | | |

_____
(title)



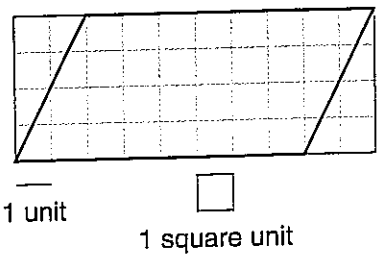
SRB 47–48 89–90 120–121

Date Time

# Math Boxes 10.6

1. Find the area of the parallelogram.

Area of a parallelogram: $A = b * h$



1 unit

1 square unit

Area: _____ square units

SRB 176

2. Solve.

a. $\frac{1}{3}$ of 36 = _____

b. $\frac{2}{5}$ of 75 = _____

c. $\frac{3}{8}$ of 88 = _____

d. $\frac{5}{6}$ of 30 = _____

e. $\frac{2}{7}$ of 28 = _____

SRB 74

3. Insert > or <.

a. $\frac{9}{14}$ _____ $\frac{10}{3}$

b. $\frac{6}{21}$ _____ $\frac{2}{6}$

c. $\frac{4}{11}$ _____ $\frac{7}{16}$

d. $\frac{8}{18}$ _____ $\frac{3}{7}$

e. $\frac{5}{24}$ _____ $\frac{2}{10}$

SRB 66 67

4. Complete the "What's My Rule?" table and state the rule.

Rule: _____

| in | out |
|---|---|
| 8 | |
| | −2 |
| 2 | −6 |
| 0 | |
| | 9 |

SRB 215 216

5. Solve.

a. $\begin{array}{r} 128.07 \\ -\ 85.25 \\ \hline \end{array}$

b. $\begin{array}{r} 18.95 \\ -\ 6.07 \\ \hline \end{array}$

c. $\begin{array}{r} 306.85 \\ +\ 216.96 \\ \hline \end{array}$

d. $\begin{array}{r} 215.29 \\ +\ 38.75 \\ \hline \end{array}$

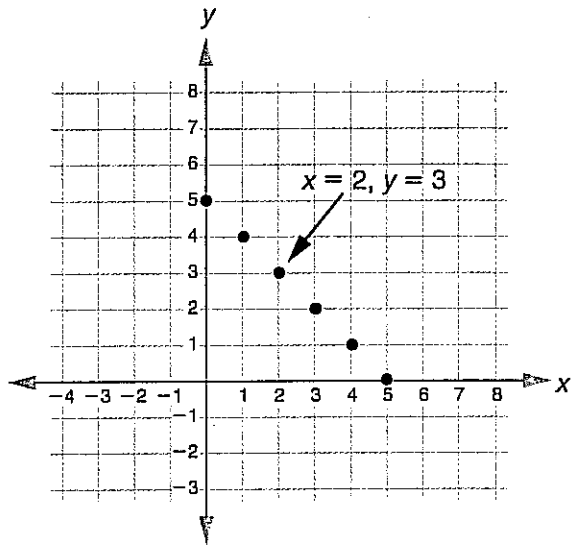
SRB 34–36

Date Time

# Rules, Tables, and Graphs

**1.** Use the graph below. Find the *x*- and *y*-coordinates for each point shown. Then enter the *x* and *y* values in the table.

| x | y |
|---|---|
| | |
| | |
| 2 | 3 |
| | |
| | |
| | |
| | |




**2.** Eli is 10 years old and can run an average of 5 yards per second. His sister Sara is 7 and can run an average of 4 yards per second.

Eli and Sara have a 60-yard race. Because Sara is younger, Eli gives her a 10-yard head start.

Complete the table showing the distances Eli and Sara are from the starting line after 1 second, 2 seconds, 3 seconds, and so on.

Use the table to answer the questions below.

| Time (sec) | Distance (yd) | |
|---|---|---|
| | Eli | Sara |
| start | 0 | 10 |
| 1 | | |
| 2 | | 18 |
| 3 | 15 | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | 38 |
| 8 | | |
| 9 | | |
| 10 | | |
| 11 | | |
| 12 | | |

**a.** Who wins the race? _____

**b.** What is the winning time?

_____

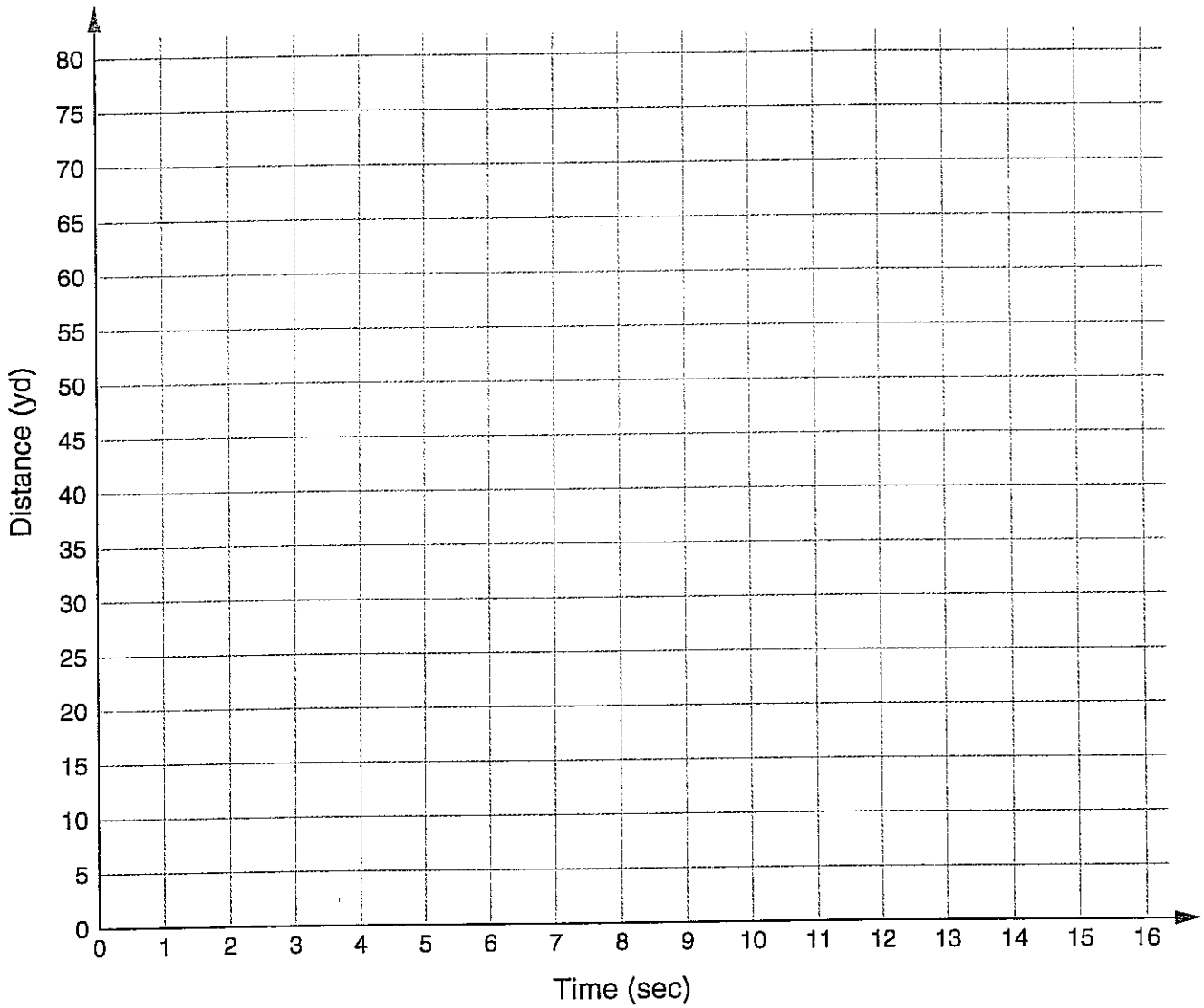
**c.** Who was in the lead during most of the race?

_____

Date Time

# Rules, Tables, and Graphs (cont.)

3. Use the grid below to graph the results of the race between Eli and Sara.




4. How many yards apart are Eli and Sara after 7 seconds? _____

5. Suppose that Eli and Sara race for 75 yards instead of 60 yards.

   a. Who would you expect to win? _____

   b. How long would the race last? _____ seconds

   c. How far ahead would the winner be at the finish line? _____ yards

Date Time

# Running and Walking Graph

## Math Message

Rachel, William, and Tamara timed themselves traveling the same distance in different ways. Rachel ran, William walked, and Tamara walked toe-to-heel.

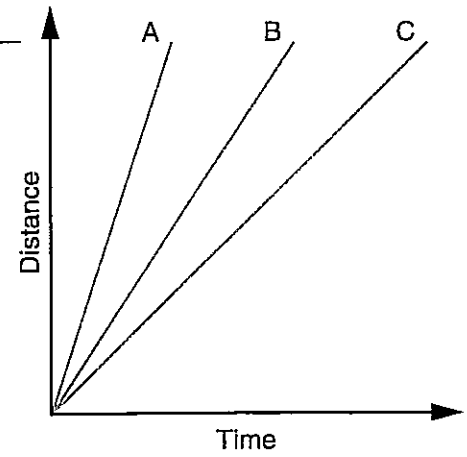
After they timed themselves, they drew a graph.

1. Which line on the graph at the right is for Rachel? _____

2. Which line is for William? _____

3. Which line is for Tamara? _____

4. Sam came along later and was the slowest of all. He walked heel-to-toe backwards. Draw a line on the graph to show at what speed you think Sam walked.




## Review: Algebraic Expressions

Complete each statement with an algebraic expression.

5. Bill is 5 years older than Rick. If Rick is $R$ years old, then Bill is _____ years old.

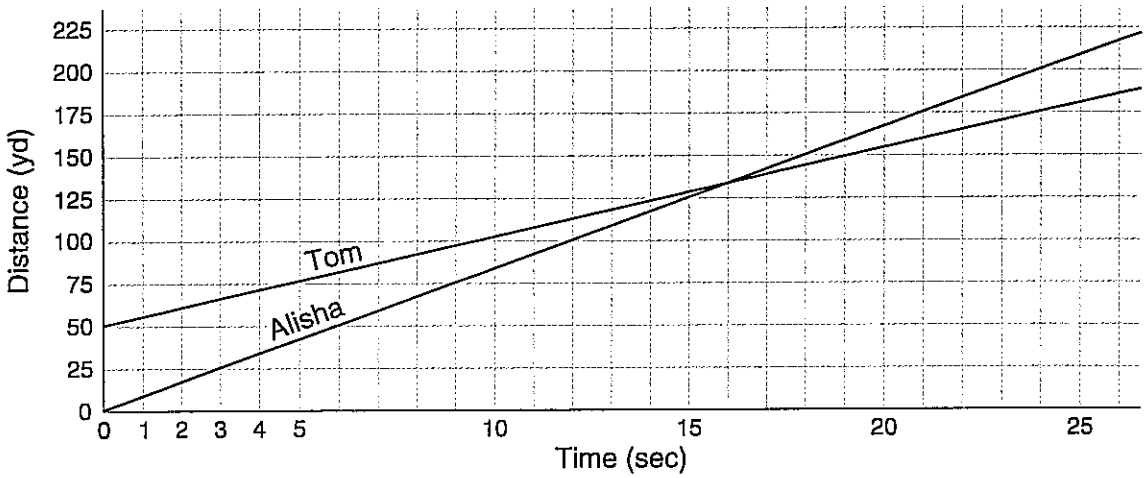
6. Rebecca's piano lesson is one half as long as Lisa's. If Lisa's piano lesson is $L$ minutes long, then Rebecca's is _____ minutes long.

7. Jamie's dog weighs 3 pounds more than twice the weight of Eddy's dog. If Eddy's dog weighs $E$ pounds, then Jamie's dog weighs _____ pounds.

Date Time

# Reading Graphs

1. Tom and Alisha run a 200-yard race. Tom has a head start.




a. Who wins the race? _____

b. By about how much? _____

c. Mark the point on the graph where Alisha overtakes Tom.

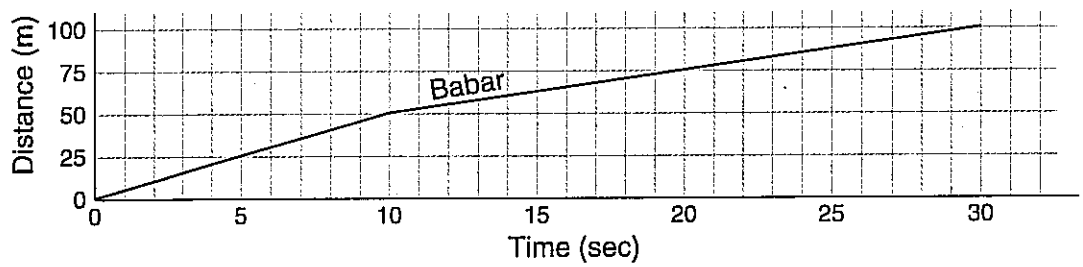
d. About how many yards does Alisha run before taking the lead? _____

e. About how many seconds pass before Alisha takes the lead? _____

f. Who is ahead after 9 seconds? _____

g. By about how much? _____

2. Babar is definitely out of shape, but he runs 100 meters as fast as he can.



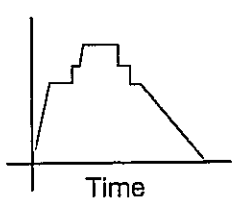

a. In the **first 10 seconds** of his run, Babar covers about _____ meters, and his speed is about $\frac{\square \text{ meters}}{10 \text{ seconds}} = \frac{\square \text{ meters}}{1 \text{ second}}$.

b. In the final 10 seconds of his run, Babar covers about _____ meters, and his speed is about $\frac{\square \text{ meters}}{10 \text{ seconds}} = \frac{\square \text{ meters}}{1 \text{ second}}$.

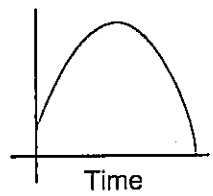
Date Time

# Mystery Graphs

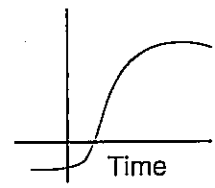
Each of the events described below is represented by one of the following graphs:



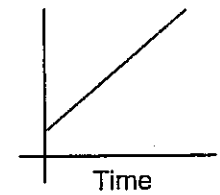

**Graph A**



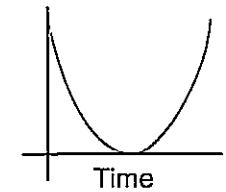

**Graph B**




**Graph C**




**Graph D**




**Graph E**

Match each event with its graph.

1. A frozen dinner is removed from the freezer. It is heated in a microwave oven. Then it is placed on the table.

   Which graph shows the temperature of the dinner at different times? Graph _____

2. Satya runs water into his bathtub. He steps into the tub, sits down, and bathes. He gets out of the tub and drains the water.

   Which graph shows the height of water in the tub at different times? Graph _____

3. A baseball is thrown straight up into the air.

   a. Which graph shows the height of the ball—from the time it is thrown until the time it hits the ground? Graph _____

   b. Which graph shows the speed of the ball at different times? Graph _____

Date Time

# Math Boxes 10.7

1. a. I am a polygon with exactly 4 angles, each of a different size. What shape am I?

_____

b. Draw what I look like.

2. Add or subtract.

a. $20 + (-10) =$ _____

b. $-8 + (-17) =$ _____

c. $-12 - (-12) =$ _____

d. $-45 + 45 =$ _____

e. $-31 - 14 =$ _____

3. List all of the factors for 144.

_____

_____

_____

4. Add or subtract.

a. $5\frac{4}{5} - 3\frac{7}{4} =$ _____

b. $3\frac{1}{8} + \frac{16}{6} =$ _____

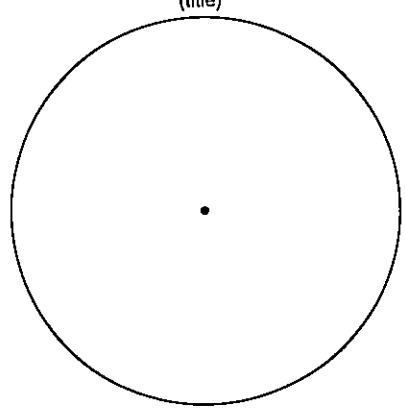
c. _____ $= 2\frac{4}{9} + 3\frac{7}{3}$

d. _____ $= 1\frac{9}{10} - \frac{15}{8}$

5. Mr. Kim's art class asked 50 people each to name their favorite kind of movie. The results are shown in the table. Complete the table and then make a circle graph of the results.

| Kind of Movie | Number of People | Percent of Total |
|---|---|---|
| Action | 23 | |
| Comedy | 14 | |
| Romance | 2 | |
| Thriller | 7 | |
| Mystery | 4 | |
| Total | | |

_____
(title)





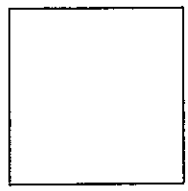
Use with Lesson 10.7.

Date Time

# A Problem from the National Assessment

The following problem was in the mathematics section of a 1975 national standardized test.

A square has a perimeter of 12 inches.
What is the area of the square?



1. Your answer: _____ $in.^2$

The table below gives the national results for this problem.

| | 13-Year-Olds | 17-Year-Olds | Young Adults |
|---|---|---|---|
| Correct answer | 7% | 28% | 27% |
| 144 sq inches | 12% | 19% | 25% |
| 48 sq inches | 20% | 10% | 10% |
| 24 sq inches | 6% | 4% | 2% |
| 12 sq inches | 4% | 3% | 3% |
| 6 sq inches | 4% | 2% | 1% |
| 3 sq inches | 3% | 2% | 2% |
| Other incorrect answers | 16% | 13% | 10% |
| No answer or "I don't know" | 28% | 19% | 20% |

Explain why many students might have given the following answers:

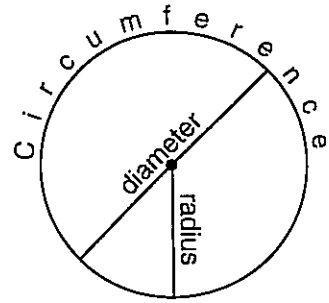
2. 144 square inches _____

3. 48 square inches _____

Date Time

# Ratio of Circumference to Diameter

You are going to explore the relationship between the circumference and the diameter of a circle.




1. Using a metric tape measure, carefully measure the circumference and diameter of a variety of round objects. Measure to the nearest millimeter (one-tenth of a centimeter).

2. Record your data in the first three columns of the table below.

3. In the fourth column, write the ratio of the circumference to the diameter as a fraction.

4. In the fifth column, write the ratio as a decimal. Use your calculator to compute the decimal and round your answer to two decimal places.

| | | | Ratio of Circumference to Diameter | |
|---|---|---|---|---|
| **Object** | **Circumference ($C$)** | **Diameter ($d$)** | **Ratio as a Fraction ($\frac{C}{d}$)** | **Ratio as a Decimal (from calculator)** |
| Coffee cup | 252 mm | 80 mm | $\frac{252}{80}$ | 3.15 |
| | _____ mm | _____ mm | | |
| | _____ mm | _____ mm | | |
| | _____ mm | _____ mm | | |
| | _____ mm | _____ mm | | |
| | _____ mm | _____ mm | | |

5. What is the median of the circumference to diameter ratios in the last column?

_____

6. The students in your class combined their results in a stem-and-leaf plot. Use that plot to find the class median value for the ratio $\frac{C}{d}$.

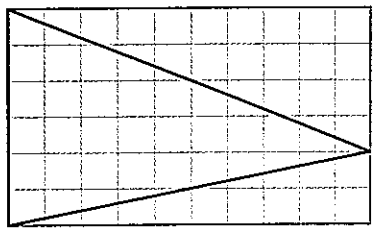
_____

Date Time

# Math Boxes 10.8

**1.** Find the area of the triangle.

Area of a Triangle: $A = \frac{1}{2} * b * h$




Area: _____ square units

**2.** If a set has 48 objects, how many objects are there in

a. $\frac{3}{8}$ of the set? _____

b. $\frac{8}{3}$ of the set? _____

c. $\frac{5}{6}$ of the set? _____

d. $\frac{7}{12}$ of the set? _____

e. $\frac{17}{16}$ of the set? _____

**3.** Insert > or <.

a. $\frac{8}{9}$ _____ $\frac{8}{10}$

b. $\frac{3}{5}$ _____ $\frac{3}{7}$

c. $\frac{6}{7}$ _____ $\frac{5}{6}$

d. $\frac{7}{12}$ _____ $\frac{7}{14}$

e. $\frac{9}{11}$ _____ $\frac{14}{15}$

**4.** Complete the "What's My Rule?" table and state the rule.

Rule: _____

| in | out |
|---|---|
| $\frac{1}{3}$ | |
| | 0 |
| $\frac{5}{3}$ | 4 |
| | 2 |
| $-2$ | $\frac{1}{3}$ |

**5.** Solve.

a. $\begin{array}{r} 40.017 \\ +\ 269.000 \\ \hline \end{array}$

b. $\begin{array}{r} 24.303 \\ +\ 5.700 \\ \hline \end{array}$

c. $\begin{array}{r} 402.03 \\ -\ 24.70 \\ \hline \end{array}$

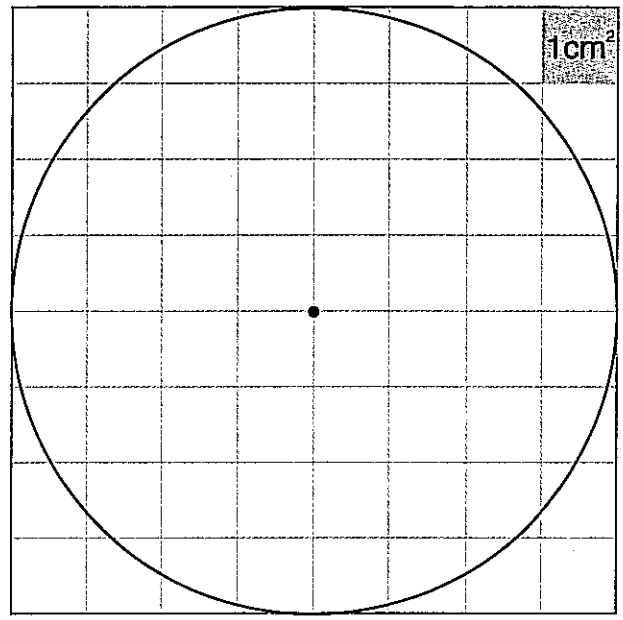
d. $\begin{array}{r} 590.32 \\ -\ 465.75 \\ \hline \end{array}$

Date Time

# Measuring the Area of a Circle

## Math Message

Use the circle at the right to solve Problems 1–4.




1. The diameter of the circle is about _____ centimeters.

2. The radius of the circle is about _____ centimeters.

3. The circumference of the circle is about _____ centimeters.

4. Find the area of this circle by counting squares. About _____ $cm^2$

## Follow-Up

5. What is the median of all the area measurements in your class? _____ $cm^2$


### More Pi, Anyone?

In 1999, Japanese computer scientists claimed a world record when they calculated pi to more than 206,158,430,000 digits on a computer at the University of Tokyo. The work took 13 hours to do and 46 hours to check. If a number with that many digits was printed on one line with 6 digits per centimeter, it would stretch more than 340,000 kilometers, or almost as far as the distance between Earth and the moon.

*Source:* University of Tokyo

Date Time

# Areas of Circles

Work with a partner. Use the same objects, but make separate measurements so that you can check each other's work.

1. Trace several round objects onto the grid on *Math Masters,* page 2.

2. Count square centimeters to find the area of each circle.

3. Use a ruler to find the radius of each object. (*Remember:* The radius is half the diameter.) Record your data in the first three columns of the table below.

| Object | Area (sq cm) | Radius (cm) | Ratio of Area to Radius Squared | |
|---|---|---|---|---|
| | | | as a Fraction $\frac{A}{r^2}$ | as a Decimal |
| | | | | |
| | | | | |
| | | | | |

4. Find the ratio of the area to the square of the radius for each circle. Write the ratio as a fraction in the fourth column of the table. Then use a calculator to calculate the ratio as a decimal. Round the decimal to two decimal places and write it in the last column.

5. Find the median of the ratios in the last column. _____

Date Time

# A Formula for the Area of a Circle

Your class just measured the area and radius of many circles and found that the ratio of the area to the square of the radius is about 3.

This was no coincidence: Mathematicians proved long ago that the ratio of the area of a circle to the square of its radius is always equal to $\pi$. This can be written as:

$$\frac{A}{r^2} = \pi$$

Usually this fact is written in a slightly different form, as a formula for the area of a circle.

> The formula for the area of a circle is
>
> $$A = \pi * r^2$$
>
> where $A$ is the area of a circle and $r$ is its radius.

1. What is the radius of the circle in the Math Message on journal page 373? _____

2. Use the formula above to calculate the area of that circle. _____

3. Is the area you found by counting square centimeters more or less than the area you found by using the formula? _____

   How much more or less? _____

4. Use the formula to find the areas of the circles you traced on *Math Masters*, page 2.

   _____ _____ _____

5. Which do you think is a more accurate way to find the area of a circle, by counting squares or by measuring the radius and using the formula? Explain.

   _____

   _____

   _____

   _____

Date Time

# Fraction and Percent Multiplication

Complete the following.

1. 30% of 50 is _____.
2. 25% of 36 is _____.
3. 5% of 150 is _____.
4. 75% of 12 is _____.
5. 80% of 60 is _____.
6. 50% of 130 is _____.

Find the whole.

7. 50% of _____ is 12.
8. $\frac{3}{4}$ of _____ is 21.
9. 90% of _____ is 180.
10. $\frac{5}{6}$ of _____ is 25.
11. 20% of _____ is 19.
12. $\frac{3}{8}$ of _____ is 24.

Multiply.

13. $\frac{1}{2} * \frac{3}{4} =$ _____
14. $2\frac{3}{4} * \frac{3}{5} =$ _____
15. $1\frac{1}{2} * 2\frac{1}{4} =$ _____
16. $\frac{3}{4} * 5 =$ _____
17. $7 * \frac{4}{5} =$ _____
18. $\frac{5}{6} * \frac{1}{5} =$ _____

Date Time

# Math Boxes 10.9

1. I am a polygon with exactly 6 angles. What shape am I?

_____

Name an object that has my shape somewhere on it.

_____

Do all of my angles have to be the same size? _____ Explain. _____

_____

2. Add or subtract.

a. $24 + (-40) =$ _____

b. $-7 - (-23) =$ _____

c. $-43 + (-16) =$ _____

d. $37 - (-37) =$ _____

e. $-10 + 14 =$ _____

3. List all of the factors for 205.

_____

4. Add or subtract.

a. $3\frac{5}{8} - 1\frac{2}{5} =$ _____

b. $2\frac{6}{7} - \frac{9}{4} =$ _____

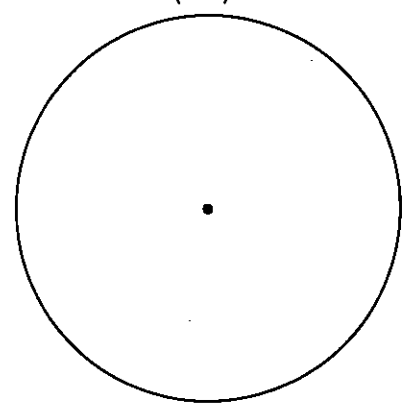
c. _____ $= \frac{37}{5} + 8\frac{3}{2}$

d. _____ $= \frac{12}{100} + \frac{25}{4}$

5. Ms. Hopheart's class asked 50 people to name their favorite kind of fruit. The results are shown in the table. Complete the table and then make a circle graph of the results.

| Kind of Fruit | Number of People | Percent of Total |
|---|---|---|
| Apples | 20 | |
| Bananas | 12 | |
| Grapes | 5 | |
| Oranges | 8 | |
| Other | 5 | |
| Total | 50 | |

_____
(title)



Date Time

# Time to Reflect

1. Explain to a new student what is special about the number $\pi$ and what you have used it for.

2. Look through your journal. Which lesson or lessons were your favorites in this unit? Explain.

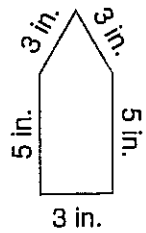
3. Janet wanted to know how long it would take her to drive 525 miles. She was traveling at about 65 miles per hour. Explain how she might solve this problem using a graph, a formula, or a table.

Date Time

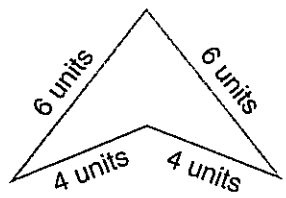
# Math Boxes 10.10

1. Find the perimeter of each figure.

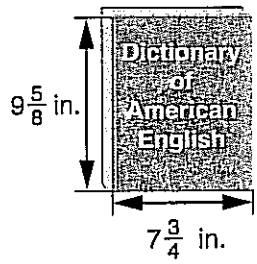
   a. Perimeter: _____



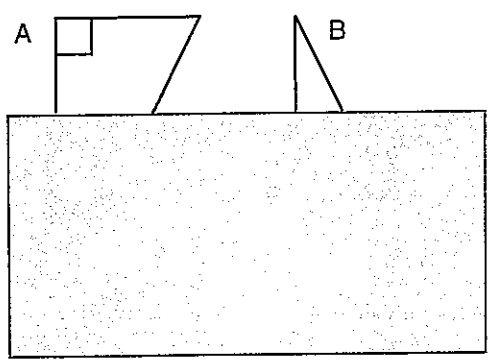

   b. Perimeter: _____




2. The area of the cover of the dictionary is about _____ (unit).




3. Triangles A and B are partially covered. One of them has an obtuse angle. Which triangle could this be? (Circle A or B.)

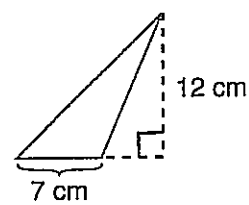



Draw what the triangles might look like if the drawings were complete.

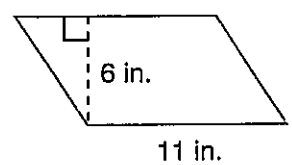
4. Find the area of each figure.

| |
|---|
| Area of a triangle: $A = \frac{1}{2} * b * h$ |
| Area of a parallelogram: $A = b * h$ |

   a. Area: _____ (unit)




   b. Area: _____ (unit)




   c. Area: _____ (unit)