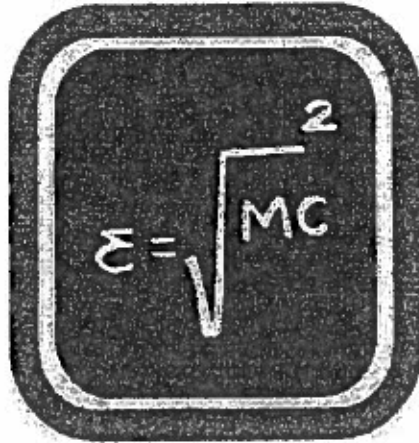


6<sup>th</sup> Grade Summer Advanced Math Packet

Your Summer Math Packet is attached. Please complete each page and show your work either on the page itself or attached on a clearly labeled piece of loose leaf. The packet must be returned to your math teacher on the first day of school in September.

You may use the following website as helpful guides:

[www.khanacademy.org](http://www.khanacademy.org)

[www.homeworkspot.com/middle/math](http://www.homeworkspot.com/middle/math)

[www.mathvids.com/level/show/3-middle-school-math](http://www.mathvids.com/level/show/3-middle-school-math)



# Ordering Fractions

Rewrite each group of fractions using the LCD.

1.  $\frac{2}{5}, \frac{1}{3}, \frac{3}{15}$  \_\_\_\_\_

2.  $\frac{1}{8}, \frac{3}{5}, \frac{2}{3}$  \_\_\_\_\_

3.  $\frac{2}{5}, \frac{1}{2}, \frac{5}{8}$  \_\_\_\_\_

4.  $\frac{3}{4}, \frac{1}{3}, \frac{1}{2}$  \_\_\_\_\_

5.  $\frac{1}{5}, \frac{1}{2}, \frac{2}{3}$  \_\_\_\_\_

6.  $\frac{3}{5}, \frac{7}{10}, \frac{1}{4}$  \_\_\_\_\_

Order from least to greatest.

7.  $\frac{1}{2}, \frac{1}{3}, \frac{2}{5}$  \_\_\_\_\_

8.  $\frac{5}{6}, \frac{7}{12}, \frac{2}{3}$  \_\_\_\_\_

9.  $\frac{2}{7}, \frac{2}{5}, \frac{3}{10}$  \_\_\_\_\_

10.  $\frac{2}{5}, \frac{5}{8}, \frac{2}{3}$  \_\_\_\_\_

11.  $\frac{1}{2}, \frac{3}{10}, \frac{4}{9}$  \_\_\_\_\_

12.  $\frac{2}{3}, \frac{5}{6}, \frac{3}{4}$  \_\_\_\_\_

## Mixed Applications

13. Carol, Lennie, and Brian went skating around the pond. They started out from the dock. Carol skated around the pond once every 6 minutes. It took Lennie 4 minutes and Brian 8 minutes. How many minutes did it take before all three passed by the dock at the same time?  
\_\_\_\_\_

14. Price's Pet Store had twice as many dogs as cats. Some customers bought 6 of the dogs. Then there were twice as many cats as dogs. How many cats and dogs were there at the beginning?  
\_\_\_\_\_

## NUMBER SENSE

15. In the subtraction problems below, notice that each problem has two numbers whose digits are in reverse order. Find the differences.

$$\begin{array}{r} 725 \\ -527 \\ \hline \end{array}$$

$$\begin{array}{r} 83 \\ -38 \\ \hline \end{array}$$

$$\begin{array}{r} 531 \\ -135 \\ \hline \end{array}$$

Make up three of your own subtraction problems. Choose a number, reverse the digits, and write the lesser number under the greater one.

\_\_\_\_\_

What do all six answers have in common? Look for common factors. \_\_\_\_\_

GAM

# Equivalent Fractions and Simplest Form

Write an equivalent fraction for each.

1.  $\frac{3}{4}$  \_\_\_\_\_      2.  $\frac{1}{7}$  \_\_\_\_\_      3.  $\frac{4}{9}$  \_\_\_\_\_      4.  $\frac{16}{20}$  \_\_\_\_\_      5.  $\frac{24}{42}$  \_\_\_\_\_

Write in simplest form.

6.  $\frac{7}{42}$  \_\_\_\_\_      7.  $\frac{2}{18}$  \_\_\_\_\_      8.  $\frac{6}{10}$  \_\_\_\_\_      9.  $\frac{2}{16}$  \_\_\_\_\_      10.  $\frac{75}{100}$  \_\_\_\_\_
11.  $\frac{4}{32}$  \_\_\_\_\_      12.  $\frac{3}{12}$  \_\_\_\_\_      13.  $\frac{21}{28}$  \_\_\_\_\_      14.  $\frac{15}{27}$  \_\_\_\_\_      15.  $\frac{5}{20}$  \_\_\_\_\_
16.  $\frac{6}{15}$  \_\_\_\_\_      17.  $\frac{14}{49}$  \_\_\_\_\_      18.  $\frac{30}{36}$  \_\_\_\_\_      19.  $\frac{35}{50}$  \_\_\_\_\_      20.  $\frac{12}{36}$  \_\_\_\_\_
21.  $\frac{48}{54}$  \_\_\_\_\_      22.  $\frac{15}{60}$  \_\_\_\_\_      23.  $\frac{32}{64}$  \_\_\_\_\_      24.  $\frac{30}{270}$  \_\_\_\_\_      25.  $\frac{28}{77}$  \_\_\_\_\_

## Mixed Applications

26. Calvin hiked 18 miles in 6 hours. If he continues at the same pace, how much farther can he hike in the next 2 hours?  
\_\_\_\_\_
27. Hamako made 4 hits in 9 times at bat. If she keeps the same success level, how many hits should she make in 18 times at bat?  
\_\_\_\_\_

28. In how many ways can 18 hikers be organized into 2 or more groups for trail clearing if all groups have the same number of hikers?  
\_\_\_\_\_

## MIXED REVIEW

Tell whether each number is divisible by 2, 3, 4, 5, 6, 9, or 10.

1. 12 \_\_\_\_\_      2. 30 \_\_\_\_\_      3. 360 \_\_\_\_\_      4. 96 \_\_\_\_\_

For the set of numbers 7, 6, 11, 16, 9, and 11, find each measure.

5. mean \_\_\_\_\_      6. mode \_\_\_\_\_      7. median \_\_\_\_\_      8. range \_\_\_\_\_

GAM

# Dividing Mixed Numbers

Find the quotient. Write the answer in simplest form.

- |   |   |   |
|---|---|---|
| 1. $\frac{1}{3} \div 5$ _____               | 2. $1\frac{3}{5} \div \frac{3}{5}$ _____    | 3. $2\frac{1}{8} \div \frac{1}{4}$ _____    |
| 4. $\frac{2}{3} \div 2\frac{1}{3}$ _____    | 5. $\frac{5}{6} \div 1\frac{1}{4}$ _____    | 6. $8 \div 5\frac{1}{3}$ _____              |
| 7. $3\frac{4}{7} \div \frac{5}{7}$ _____    | 8. $21 \div 2\frac{1}{3}$ _____             | 9. $5\frac{1}{4} \div \frac{1}{2}$ _____    |
| 10. $\frac{7}{8} \div 1\frac{1}{8}$ _____   | 11. $1\frac{3}{5} \div 8$ _____             | 12. $15 \div 2\frac{1}{12}$ _____           |
| 13. $9\frac{3}{4} \div 1\frac{5}{8}$ _____  | 14. $7\frac{5}{8} \div \frac{5}{8}$ _____   | 15. $5\frac{1}{2} \div \frac{1}{6}$ _____   |
| 16. $10\frac{2}{5} \div 2\frac{3}{5}$ _____ | 17. $7\frac{1}{3} \div \frac{5}{8}$ _____   | 18. $15\frac{3}{4} \div 3\frac{1}{2}$ _____ |
| 19. $16\frac{2}{3} \div 6\frac{1}{4}$ _____ | 20. $12\frac{3}{5} \div \frac{9}{10}$ _____ | 21. $1\frac{3}{4} \div 4\frac{2}{3}$ _____  |
| 22. $9\frac{3}{4} \div 2\frac{1}{6}$ _____  | 23. $\frac{3}{10} \div 2\frac{2}{5}$ _____  | 24. $4\frac{4}{5} \div 1\frac{4}{5}$ _____  |
| 25. $3\frac{1}{21} \div 2\frac{2}{7}$ _____ | 26. $11\frac{1}{9} \div \frac{5}{8}$ _____  | 27. $8\frac{1}{6} \div 2\frac{1}{3}$ _____  |

## Mixed Applications

28. Lee has a  $1\frac{1}{2}$ -pound supply of Kitty Biscuit Treats. Each day he gives his kitten  $\frac{1}{8}$  pound of the biscuits. For how many days will his supply last?  
\_\_\_\_\_
29. Lee's kitten, Sophia, is  $2\frac{1}{3}$  times as heavy as she was last year. Sophia now weighs 21 ounces. What did she weigh a year ago?  
\_\_\_\_\_

## LOGICAL REASONING

30. Find the numbers  $\Delta$  and  $\square$  if  $(1\frac{3}{5} \times \Delta) + (\frac{3}{5} \times \square) = 5$   
and  $(1\frac{3}{5} \times \square) + (\frac{3}{5} \times \Delta) = 6$ .
- $\Delta =$  \_\_\_\_\_  $\square =$  \_\_\_\_\_

6 AM

# Adding and Subtracting Fractions

Estimate. Then find the exact sum or difference. Write the answer in simplest form.

$$1. \begin{array}{r} \frac{1}{3} \\ + \frac{1}{9} \\ \hline \end{array}$$

$$2. \begin{array}{r} \frac{1}{4} \\ + \frac{7}{8} \\ \hline \end{array}$$

$$3. \begin{array}{r} \frac{5}{8} \\ - \frac{1}{2} \\ \hline \end{array}$$

$$4. \begin{array}{r} \frac{2}{3} \\ - \frac{1}{6} \\ \hline \end{array}$$

$$5. \begin{array}{r} \frac{1}{3} \\ + \frac{7}{12} \\ \hline \end{array}$$

$$6. \begin{array}{r} \frac{1}{2} \\ + \frac{4}{5} \\ \hline \end{array}$$

$$7. \begin{array}{r} \frac{5}{6} \\ - \frac{3}{4} \\ \hline \end{array}$$

$$8. \begin{array}{r} \frac{3}{4} \\ + \frac{5}{8} \\ \hline \end{array}$$

$$9. \begin{array}{r} \frac{5}{6} \\ - \frac{3}{8} \\ \hline \end{array}$$

$$10. \begin{array}{r} \frac{4}{5} \\ + \frac{11}{20} \\ \hline \end{array}$$

$$11. \frac{2}{3} + \frac{1}{6} + \frac{1}{4} \underline{\hspace{2cm}}$$

$$12. \frac{1}{2} + \frac{5}{8} + \frac{3}{8} \underline{\hspace{2cm}}$$

$$13. \frac{19}{25} - \frac{3}{5} \underline{\hspace{2cm}}$$

## Mixed Applications

14. Althea spent  $\frac{3}{4}$  of her earnings last month. She spent  $\frac{1}{4}$  on recreation,  $\frac{1}{6}$  on art supplies, and the rest on clothes. What part of her earnings did she spend on clothes?

15. The library has enough videocassettes to display equal numbers of them in groups of 3, 5, or 9. What is the least number of videocassettes the library can have?

## LOGICAL REASONING

Fill in the missing numerators.

16. The fractions have a sum of 1.  
The numerators have a sum of 4.

$$\frac{\square}{2} + \frac{\square}{5} + \frac{\square}{10} = 1$$

17. The fractions have a sum of 1.  
The numerators have a sum of 5.

$$\frac{\square}{2} + \frac{\square}{5} + \frac{\square}{10} = 1$$

18. The fractions have a sum of 1.  
The numerators have a sum of 9.

$$\frac{\square}{4} + \frac{\square}{6} + \frac{\square}{12} = 1$$

19. The fractions have a sum of 1.  
The numerators have a sum of 5.

$$\frac{\square}{4} + \frac{\square}{6} + \frac{\square}{12} = 1$$

6AM

# Adding Mixed Numbers

Find the sum. Write the answer in simplest form.

1.  $9\frac{1}{2}$   
 $+ 1\frac{1}{2}$   

---

2.  $5$   
 $+ 3\frac{1}{3}$   

---

3.  $2\frac{4}{5}$   
 $+ 16\frac{2}{5}$   

---

4.  $7\frac{1}{2}$   
 $+ 2\frac{1}{4}$   

---

5.  $8\frac{5}{6}$   
 $+ 3\frac{2}{3}$   

---

6.  $9\frac{3}{4}$   
 $+ 15\frac{1}{2}$   

---

7.  $5\frac{1}{12}$   
 $+ 2\frac{3}{4}$   

---

8.  $21\frac{1}{6}$   
 $+ 4\frac{1}{8}$   

---

9.  $2\frac{1}{2}$   
 $+ 7\frac{5}{6}$   

---

10.  $3\frac{7}{10}$   
 $+ 9\frac{1}{6}$   

---

11.  $16\frac{3}{4}$   
 $+ 5\frac{2}{3}$   

---

12.  $15\frac{1}{8}$   
 $+ 6\frac{1}{10}$   

---

13.  $6\frac{3}{4}$   
 $+ \frac{5}{8}$   

---

14.  $8\frac{4}{5}$   
 $+ 1\frac{3}{8}$   

---

15.  $10\frac{1}{7}$   
 $+ 4\frac{3}{5}$   

---

16.  $2\frac{7}{8} + 3\frac{1}{2} + 5 + 3\frac{1}{4}$  \_\_\_\_\_

17.  $5\frac{1}{2} + 2\frac{1}{3} + 9\frac{1}{6} + 2$  \_\_\_\_\_

18.  $5\frac{1}{4} + 3\frac{1}{12} + 6 + 4\frac{1}{6}$  \_\_\_\_\_

19.  $2\frac{1}{15} + 7\frac{2}{5} + 4 + 3\frac{1}{3}$  \_\_\_\_\_

## Mixed Applications

20. Four friends spent an hour picking strawberries. Jennifer picked  $1\frac{5}{8}$  quarts, Illa picked  $1\frac{3}{4}$  quarts, Lee picked  $1\frac{1}{2}$  quarts, and Wendy picked  $2\frac{1}{8}$  quarts. How many quarts did they pick?  
\_\_\_\_\_

21. Five sections of fencing around a garden are 7 yards long,  $8\frac{3}{4}$  yards long,  $12\frac{1}{2}$  yards long,  $15\frac{1}{3}$  yards long, and  $7\frac{3}{4}$  yards long. What is the total length of the fencing?  
\_\_\_\_\_

### NUMBER SENSE

Use the numbers in the box for Exercises 22–23.

$\frac{1}{8}$   $\frac{1}{6}$   $\frac{1}{4}$   $\frac{1}{3}$   $\frac{1}{2}$   $1\frac{1}{8}$

22. Find three different numbers whose sum is 1. \_\_\_\_\_

23. Find three different numbers whose sum is  $\frac{3}{4}$ . \_\_\_\_\_

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**6 Practice**

..... **Using Liquid Measurements  
in Word Problems**

Directions: Use the information on page 25 to help you do the following problems.

1. A spaghetti recipe calls for 8 cups of water. How many quarts of water are needed? \_\_\_\_\_
2. A cook needed to add 3 milliliters of food coloring to each cup of water. How much food coloring would she need for a quart of water? \_\_\_\_\_
3. A scientist added 5 mL of acid to a cup of water. How much would she need for a gallon of water? \_\_\_\_\_
4. A chemistry student was adding 7 milliliters of ammonia to a cup of vinegar. Using the same formula, how much ammonia would she add to 3 gallons of vinegar? \_\_\_\_\_
5. A sixth grader found that 20 milliliters of water would sit on the head of a penny without spilling. How many penny heads could he cover with a liter of water? \_\_\_\_\_
6. A fifth grade student wanted to add 9 milliliters of dish soap to each cup of water in her 3-gallon container. How many milliliters did she add to the 3 gallons of water? \_\_\_\_\_
7. Your best friend wanted to make a soap solution by adding 3 fluid ounces of soap to each pint of water. How much soap did she add to a gallon of water? \_\_\_\_\_
8. You decided to make a soapy water solution using 12 milliliters of water to every cup of water. How many milliliters did you add to 2 gallons of water? \_\_\_\_\_
9. One of your classmates was able to place 30 milliliters of water on the head of a quarter. How many quarter heads could she cover with a gallon of water? \_\_\_\_\_
10. Your neighbor wants to give 5 gallons of water to her roses using a 1-liter watering container. How many liters will she use? \_\_\_\_\_
11. A painter's bucket will hold 10 cups of paint. How many times will he fill his bucket to use 5 gallons of paint? \_\_\_\_\_
12. A custodian uses 1.5 cups of floor cleaner for every quart of water. How many cups of cleaner will he use with 8 gallons of water? \_\_\_\_\_



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# Make Line Graphs

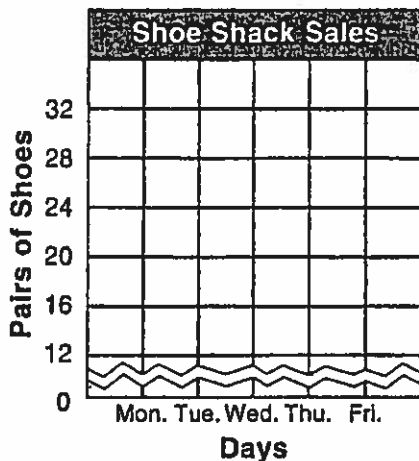
Name \_\_\_\_\_

Date \_\_\_\_\_

Use the table to complete the line graph. Then answer problems 2–4.

1.

Shoe Shack	
Day	Pairs Sold
Mon.	16
Tue.	32
Wed.	22
Thu.	28
Fri.	12



2. Between which two days was the difference in sales the least?  
\_\_\_\_\_

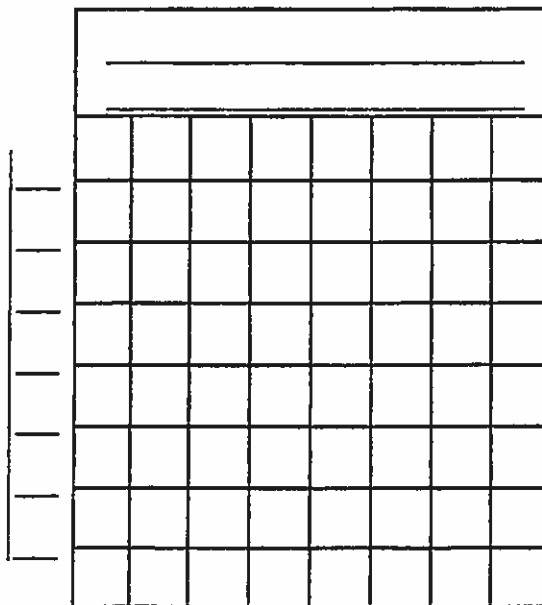
3. Between which two days was the increase in sales the most?  
\_\_\_\_\_

4. On the average, about how many pairs of shoes were sold daily?  
\_\_\_\_\_

Make a line graph for the data below.

5.

Average Monthly Temperature in Washington, DC (°F)	
Month	Temperature
Sept.	67
Oct.	55
Nov.	45
Dec.	35
Jan.	31
Feb.	34
Mar.	43



Use the graph you made in problem 5.

6. Which month is the warmest?  
the coldest?  
\_\_\_\_\_

7. About how many degrees difference is there between the average temperatures in February and October?  
\_\_\_\_\_

8. About what is the average monthly temperature for these months?  
\_\_\_\_\_

9. Between which consecutive months was there an increase of about 10°F?  
\_\_\_\_\_

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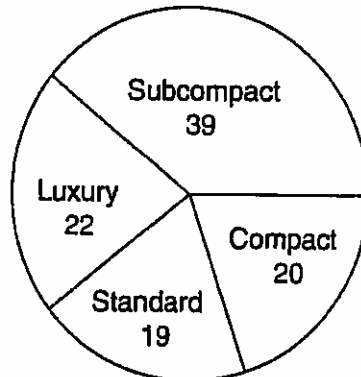
# Interpret Circle Graphs

Name \_\_\_\_\_

Date \_\_\_\_\_

Use the circle graph at the right to answer problems 1–3.

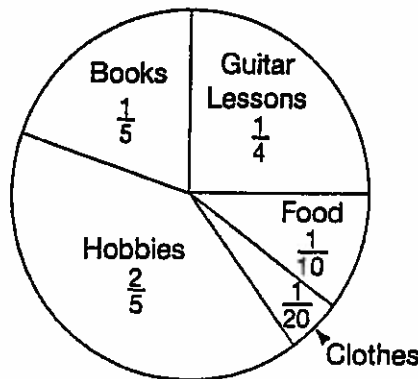
Number of Cars Purchased



- How many cars in all are represented by the graph? \_\_\_\_\_
- What fractional part of all the cars are compact? \_\_\_\_\_ luxury? \_\_\_\_\_ standard? \_\_\_\_\_ subcompact? \_\_\_\_\_
- Which two types of cars together equal the number of subcompact cars purchased?  
\_\_\_\_\_

Use the circle graph at the right to answer problems 4–9.

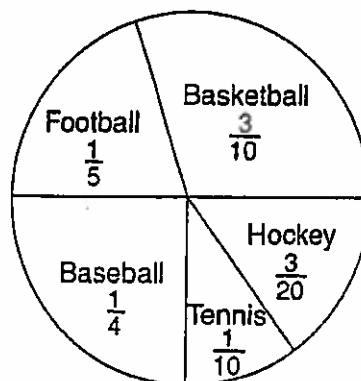
Hank's Weekly Budget



- Hank earns \$120 each week. How much does he spend on guitar lessons? \_\_\_\_\_
- How much does he spend for food? \_\_\_\_\_
- How much more does he spend for guitar lessons than books? \_\_\_\_\_
- What fractional part of Hank's budget does he spend for books, clothes, and food? \_\_\_\_\_
- How much does he spend on books, clothes, and food? \_\_\_\_\_
- What fractional part of Hank's budget does he spend for his hobbies and guitar lessons? \_\_\_\_\_

Use the circle graph at the right to answer problems 10–12.

Favorite Sport



- Which sport does the greatest number of students favor? \_\_\_\_\_
- Which sport is the least favored? \_\_\_\_\_
- If 200 students took part in the survey, how many chose:
  - football? \_\_\_\_\_
  - baseball? \_\_\_\_\_
  - hockey? \_\_\_\_\_
  - tennis? \_\_\_\_\_
  - basketball? \_\_\_\_\_

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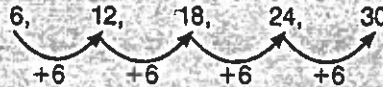
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# Sequences

Name \_\_\_\_\_

Simone counted the number of butterflies in her garden each week. She recorded the results in the table below. What rule describes the sequence?

Week	1	2	3	4	5
Butterflies	6	12	18	24	30



Look at the number of butterflies.

So, the rule is: Begin with 6, then add 6 to find the next term.

Use the rule to write the next three terms in the sequence.

1. Rule: Begin with 80; subtract 6  
80, 74, 68, 62, ... \_\_\_\_\_

2. Rule: Begin with 704; divide by 2  
704, 352, 176, 88, ... \_\_\_\_\_

3. Rule: Begin with 1; multiply by 3  
1, 3, 9, 27, ... \_\_\_\_\_

4. Rule: Begin with 10; add 1.5  
10, 11.5, 13, 14.5, ... \_\_\_\_\_

5. Rule: Begin with 1; add  $\frac{1}{2}$   
1,  $1\frac{1}{2}$ , 2,  $2\frac{1}{2}$ , ... \_\_\_\_\_

6. Rule: Begin with  $\frac{1}{5}$ , add  $\frac{1}{5}$   
 $\frac{1}{5}$ ,  $\frac{2}{5}$ ,  $\frac{3}{5}$ ,  $\frac{4}{5}$ , ... \_\_\_\_\_

Describe the rule used to create each sequence. Then find the next three terms in the sequence.

7. 42, 38, 34, 30, ...  
\_\_\_\_\_

8. 5.3, 5.9, 6.5, 7.1, ...  
\_\_\_\_\_

9. 2, 4, 8, 16, ...  
\_\_\_\_\_

10. 25, 24.8, 24.6, 24.4, ...  
\_\_\_\_\_

## Problem Solving

11. One thousand pounds of recycled paper are needed for a product. If a machine in a factory produces 30 pounds of recycled paper every minute, how many more pounds of recycled paper are needed after 8 minutes?  
\_\_\_\_\_

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# Use Coordinate Graphs

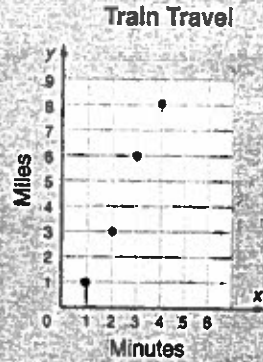
Name \_\_\_\_\_

The coordinate plane to the right shows the distance a train travels and the time in minutes it takes to travel.

What do the coordinates (3, 6) mean?

- 3 is the  $x$ -coordinate, the time in minutes.
- 6 is the  $y$ -coordinate, the distance in miles.

So, (3, 6) means that the train traveled 3 miles in 6 minutes.



Use the coordinate plane for exercises 1–4.

1. What do the points (2, 0) and (4, 1) mean?

\_\_\_\_\_

2. Graph the points (3, 2) and (2, 3).

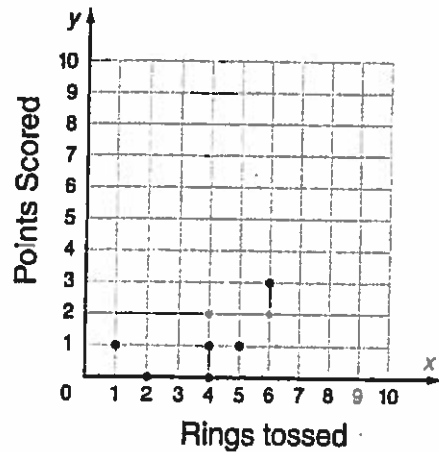
3. What is the difference in the meaning of (3, 2) and (2, 3)?

\_\_\_\_\_

4. What was the greatest number of points scored and how many rings were tossed for that score?

\_\_\_\_\_

### Ring Toss Game at School Carnival



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## Problem Solving

Solve. Use the coordinate plane above.

5. Three points on the coordinate plane have 1 as the  $y$ -coordinate, but they have different  $x$ -coordinates. Explain why.

\_\_\_\_\_

6. Players score points by tossing their rings into different sections of a target. How would the graph change if the number of points in each section were doubled?

\_\_\_\_\_