Equivalent Ratios

Name: _____

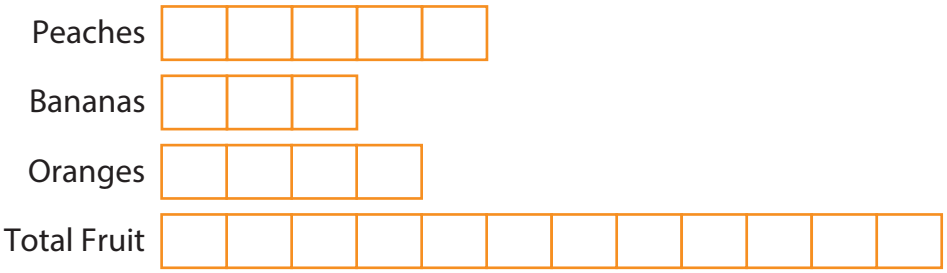
Prerequisite: Compare Quantities Using Ratios

Study the example problem showing how to use ratios to compare two quantities. Then solve problems 1–6.

Example

Noelle buys 5 peaches, 3 bananas, and 4 oranges at a local fruit stand to make fruit punch. What is the ratio of the number of bananas to the number of peaches she bought?

A tape diagram can help you compare the quantities.



There are 3 bananas and 5 peaches.

The ratio of bananas to peaches can be written as 3 to 5, 3 : 5, or $\frac{3}{5}$.

1 What is the ratio of peaches to oranges?

_____

2 What is the ratio of the number of bananas to the total number of pieces of fruit?

_____

3 Write a ratio in words to compare a whole to a part. Then write the ratio using numbers.

_____

_____

Vocabulary

ratio a comparison of two quantities.

Solve.

4 In Ellen's sixth-grade class, there are 14 boys and 11 girls. Write each ratio using numbers in two ways.

Number of girls to number of boys

_____

Number of boys to total number of students

_____

Total number of students to number of girls

_____

Number of boys to number of girls

_____

5 For every 4 miles that Pedro runs, he walks 3 miles. Tell whether each statement is *True* or *False*.

a.	The ratio of miles walked to miles run is 4 : 3.	☐ True	☐ False
b.	The ratio of miles walked to total miles is 3 : 7.	☐ True	☐ False
c.	The ratio of miles run to total miles is 7 to 3.	☐ True	☐ False
d.	The ratio of total miles to miles run is $\frac{7}{4}$.	☐ True	☐ False
e.	The ratio of miles run to miles walked is 4 to 3.	☐ True	☐ False

6 For sixth-grade field day, 6 students in Alice's class are playing volleyball, 5 students are playing soccer, and 9 students are playing basketball. Alice said that the ratio of students playing volleyball to basketball was 6 : 9. Alex said that the ratio of students playing basketball to volleyball was $\frac{9}{6}$. Who is correct? Explain.

_____

_____

_____

_____

Name: _____

Show Equivalent Ratios

Study the example problem showing how to find equivalent ratios. Then solve problems 1–7.

Example

Elena uses 12 red beads to make 4 bracelets. How many red beads will Elena need to make 12 bracelets? How many red beads will Elena need to make 20 bracelets?

You can make a table showing the number of bracelets that can be made with different numbers of red beads. The pairs of numbers in each column show the ratio of red beads to bracelets. Notice the ratios are all equivalent.

Number of Red Beads	3	6	12	24	36	48	60	72
Number of Bracelets	1	2	4	8	12	16	20	24

The table shows Elena will need 36 red beads to make 12 bracelets. Elena will need 60 red beads to make 20 bracelets.

1 How many red beads will Elena need to make 16 bracelets?

_____

2 How many bracelets can Elena make with 24 red beads?

_____

3 Find the rate of red beads per bracelet. Explain how you found your answer.

_____

_____

4 James said that he would need 25 red beads to make 75 bracelets. Is he correct? How did he get that answer?

_____

_____

_____

Solve.

Use the following information to solve problems 5–7.

The list below shows how many servings of different breakfast items that a restaurant expects to sell every 15 minutes:

Cups of coffee	25
Glasses of orange juice	10
Omelets	6

5 How many glasses of orange juice does the restaurant expect to sell in 1 hour?

Show your work.

Solution: _____

6 At this rate, how long will it take to sell 200 cups of coffee?

Show your work.

Solution: _____

7 The restaurant serves breakfast from 6:00 AM until 10:30 AM. They sell 6 omelets every 15 minutes. Should the restaurant expect to sell more than or fewer than 100 omelets? Explain your answer.

_____

_____

_____

_____

_____

Name: _____

Graph Equivalent Ratios

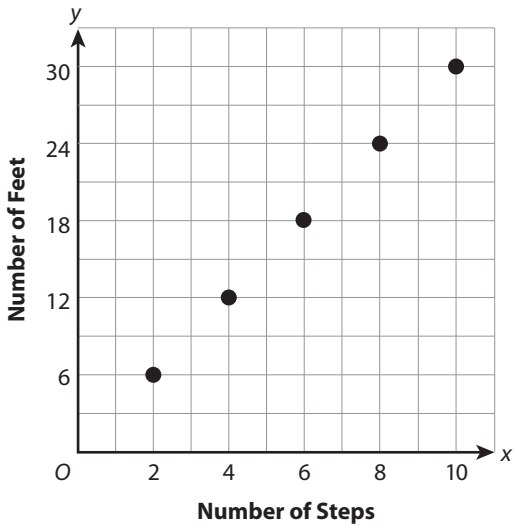
Study the example problem showing how to graph equivalent ratios. Then solve problems 1–10.

Example

The graph compares how far Jorge walks to how many steps he takes. How many feet does he walk in 6 steps? How many steps does Jorge take to walk 30 feet?

Each point on the graph can be represented by an ordered pair. The point represented by (6, 18) shows that Jorge takes 6 steps to walk 18 feet.

The ordered pair for 30 feet is (10, 30), which means that Jorge walks 30 feet in 10 steps.



1 What ordered pair represents the number of steps Jorge takes to walk 24 feet?

_____

2 Choose another point on the graph. Write the ordered pair and tell what it represents.

_____

3 What ordered pair represents the number of feet Jorge walks in 3 steps?

_____

4 Joan looks at the graph and says the number of steps is always 3 times the number of feet. Is she correct? Explain your answer.

_____

_____

Solve.

Use the following situation for problems 5–8.

To make a scarf, Jenny uses blue yarn and white yarn. The number of yards of blue yarn she uses is 4 times the number of yards of white yarn in each scarf.

5 Write four ratios to show the number of yards of white yarn to blue yarn for each scarf.

6 Are the ratios in problem 5 equivalent? Explain how you know.

7 Jenny wants to make a scarf that uses 24 yards of blue yarn. How many yards of white yarn will she need?

8 If Jenny wants to keep the ratio of blue yarn to white yarn the same, can she make a scarf using 42 yards of blue yarn? If so, how much white yarn will she need? If not, why not?

9 Adrianna can read 7 pages in 10 minutes. At this rate, how many pages can she read in 25 minutes?

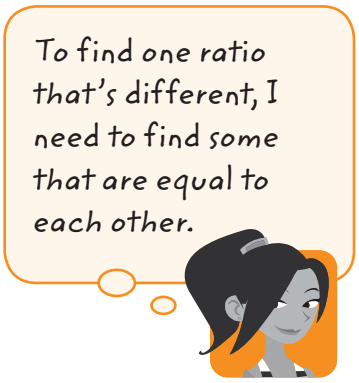
10 Max calculated that he could read at a rate of 2 pages per minute. Is he reading at a faster rate than Adrianna? Explain.

Name: _____

Equivalent Ratios

Solve the problems.

1 Kate, Mario, Sato, and Den each use a different recipe to make trail mix. Which recipe uses a different ratio of cups of raisins to cereal than the rest?



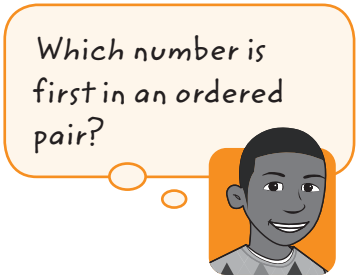
A Kate uses 3 cups of raisins for every 8 cups of cereal.

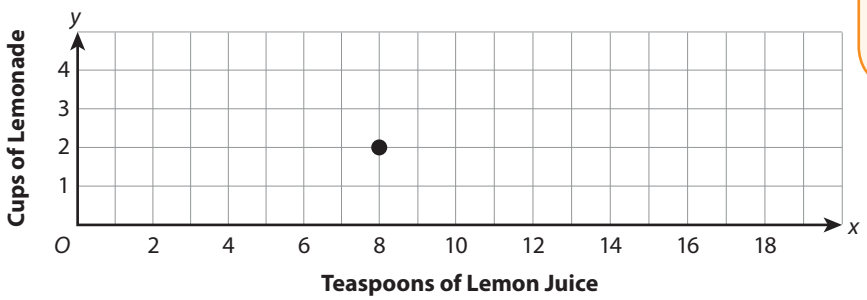
B Mario uses 4 cups of raisins for every 12 cups of cereal.

C Sato uses 6 cups of raisins for every 16 cups of cereal.

D Den uses 9 cups of raisins for every 24 cups of cereal.

2 The graph shows the number of teaspoons of lemon juice in cups of lemonade.





Which ordered pair represents a ratio equivalent to the ratio of teaspoons of lemon juice to cups of lemonade shown by the point on the graph?

A (4, 16)

B (6, 1)

C (9, 3)

D (16, 4)

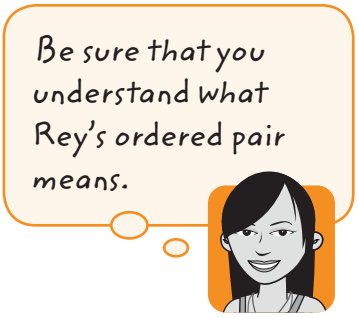
Oscar chose **A** as the correct answer. How did he get that answer?

_____

_____

Solve.

3 Rey buys 4 cards for $10. He plots the point (4, 10) on a graph. All cards are the same price. He wants to see how much it would cost to buy more cards. Tell whether each statement is *True* or *False*.



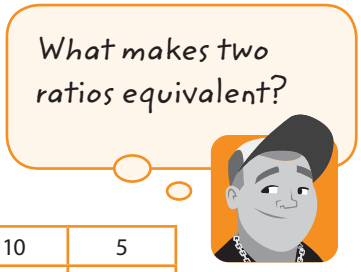
a. The point (6, 15) will be on the graph. ☐ True ☐ False

b. Rey buys 1 card for $3.50. ☐ True ☐ False

c. Rey buys 100 cards for less than $40. ☐ True ☐ False

d. The point (14, 35) will be on the graph. ☐ True ☐ False

4 Each table shows four ratios of boys to girls at different sporting events. Which tables show four equivalent ratios of boys to girls? Select all that apply.



A

3	5	9	12
5	7	15	20

B

3	4	7	11
12	16	28	44

C

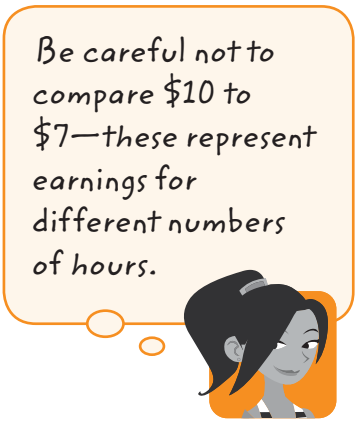
45	25	10	5
18	10	4	2

D

200	150	100	50
50	40	30	20

5 Rosa earns $10 for every 3 hours that she works. Ralph earns $7 for every 2 hours that he works. Who earns more per hour? How much *more* does this person earn after 12 hours of work?

Show your work.



Solution: _____

_____