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Comparing and Scaling RETAKE PRACTICE

7.RP.1: Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.

1. This diagram shows how much apple juice is mixed with carrot juice for a recipe.



How many cups of apple juice are used for 1 cup of carrot juice? Show your work to find this unit rate and include units.

$$\frac{4 \text{ cups apple}}{2 \text{ cups carrot}} = \frac{x}{1 \text{ cup carrot}}$$

$\cdot 0.5$

$$x = 4 \cdot 0.5 =$$

2 cups apple juice
per 1 cup carrot juice

2. For a drink recipe, there is a ratio of 2 quarts papaya juice to 8 quarts of carrot juice.

How many quarts of papaya juice are used for 1 quart of carrot juice? Show your work to find this unit rate and include units.

$$2 \text{ quarts papaya juice} \div 8 \text{ quarts carrot juice}$$

$$= \frac{1}{4} \text{ or } 0.25 \text{ quarts papaya juice to one quart carrot juice}$$

3. The train ride at the zoo covers a distance of $2\frac{1}{2}$ miles in $\frac{1}{3}$ of an hour.

How many miles per hour does the train go? Show your work to find this unit rate and include units.

$$2\frac{1}{2} \text{ miles} \div \frac{1}{3} \text{ hour} = 7\frac{1}{2} \text{ or } 7.5 \text{ miles per hour}$$

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7.RP.2a: Decide whether two quantities are in a proportional relationship by testing for equivalent ratios in a table or by graphing and observing if it is a straight line through the origin.

1. For EACH table below, decide whether or not it represents a proportional relationship.

yes

x	y
0	0
1	10
2	20
3	30
4	40

no

x	y
0	10
1	12
2	14
3	16
4	18

no

x	y
1	5
2	7
3	9
4	11
5	13

yes

x	y
0	0
1	15
2	30
3	45
4	60

yes

x	y
1	4
2	8
3	12
4	16
5	20

$$\frac{1}{10} = \frac{2}{20}$$

$$\frac{1}{12} \neq \frac{2}{14}$$

$$\frac{1}{5} \neq \frac{2}{7}$$

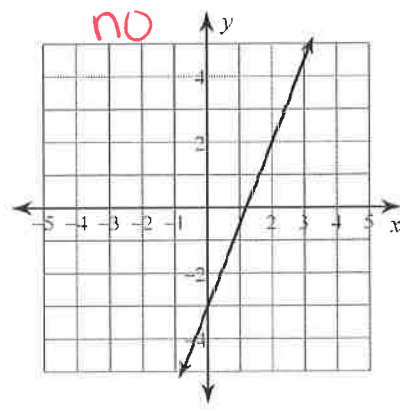
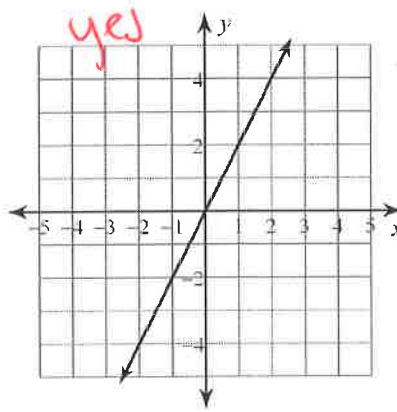
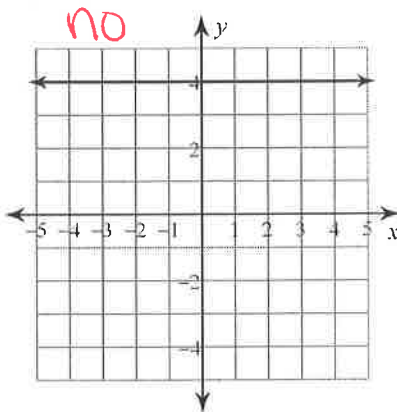
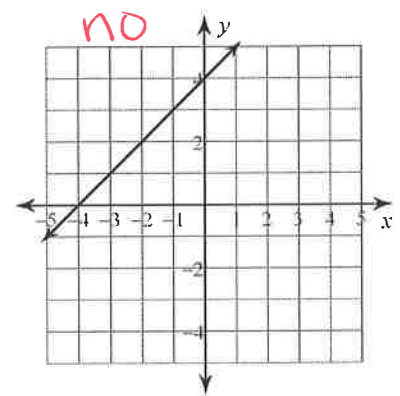
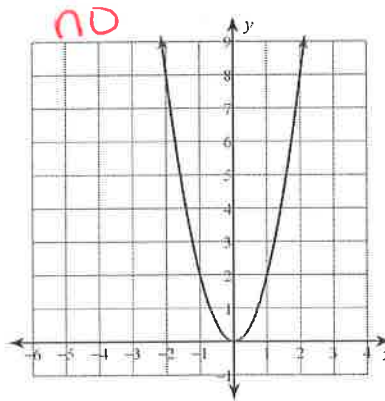
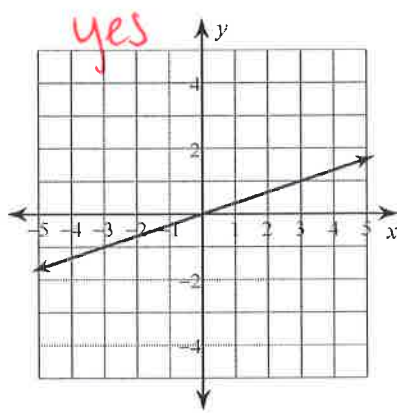
$$\frac{1}{15} = \frac{2}{30}$$

$$\frac{1}{4} = \frac{2}{8}$$

2. Explain how you know if a table represents a proportional relationship.

The table has equivalent ratios between the values.

3. For EACH table below, decide whether or not it represents a proportional relationship.



4. Explain how you know if a graph represents a proportional relationship.

The graph is a straight line through (0,0).

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Comparing and Scaling Unit Test Practice

7.RP.2b: Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

7.RP.2c: Represent proportional relationships by equations.

1. The following tables show a proportional relationship between x and y .

A.

x	y
2	20
3	30
4	40
5	50
10	100

What is the constant of proportionality for table A?

10

What is the equation for table A?

$$y = 10x$$

B.

x	y
3	0.75
5	1.25
10	2.5
15	3.75
20	5

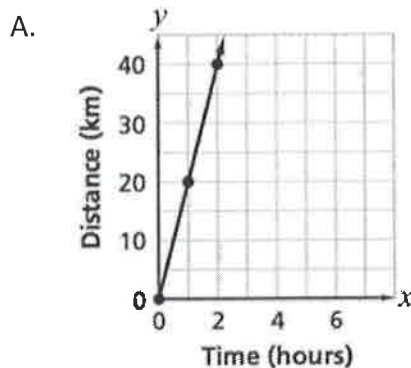
What is the constant of proportionality for table B?

0.25

What is the equation for table B?

$$y = 0.25x$$

2. The following graphs show a proportional relationship between x and y .

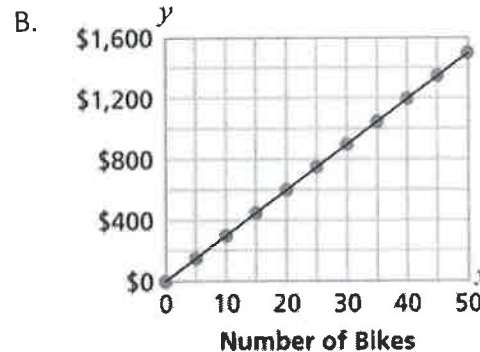


What is the constant of proportionality for graph A?

20

What is the equation for graph A?

$$y = 20x$$



What is the constant of proportionality for graph B?

30

What is the equation for graph B?

$$y = 30x$$

3. The following equations show a proportional relationship between x and y .

A. $y = 2.5x$

B. $y = \frac{5}{6}x$

a. What is the constant of proportionality for equation A? 2.5

b. What is the constant of proportionality for equation B? $\frac{5}{6}$

7.RP.2d: Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate.

Graphs A and B above show a proportional relationship between x and y . What do the following points represent in terms of the situation?

1. Graph A: $(0, 0)$ you travel 0 km in 0 hours
 $(1, 20)$ you travel 20 km in 1 hour
 $(2, 40)$ you travel 40 km in 2 hours
2. Graph B: $(0, 0)$ it cost \$0 to buy 0 bikes
 $(1, 30)$ it costs \$30 to buy 1 bike
 $(40, 1200)$ it costs \$1200 to buy 40 bikes

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Comparing and Scaling Unit Test Practice**1.RP.3:** Use proportional relationships to solve multistep ratio and percent problems.

1. The ratio of blueberries to pomegranate in a fruit smoothie drink is 5 to 15. What percent of the total drink is pomegranates? Write and solve a proportion to find the answer, and include units.

$$\text{total} = 5 + 15 = 20 \quad \frac{15 \text{ pomegranate}}{20 \text{ total}} = \frac{x\% \text{ pomegranate}}{100\% \text{ total}}$$

$$x = 15 \cdot 0.5 = \boxed{75\% \text{ pomegranate}}$$

2. You have lunch at a sushi restaurant with your friends. The bill before tax is \$47.90, and the sales tax is 9%. You decide to leave a 15% tip for the waitress based on the pre-tax amount. What will be the amount of the total bill, including tax and tip?

$$\frac{\$47.90}{100\%} = \frac{\$x}{109\%}$$

↘
•1.09

$$\frac{\$47.90}{100\%} = \frac{\$x}{15\%}$$

↘
•0.15

$$x = 47.90 \cdot 0.15 = \$7.185 \text{ tip}$$

$$x = 47.90 \cdot 1.09 = \$52.211 \text{ after tax}$$

$$52.211 + 7.185 = 59.396 = \boxed{\$59.40 \text{ total}}$$

- Bill has a paper route in his neighborhood. It takes him 50 minutes to deliver newspapers to the 40 customers on his route. How long will it take Bill to complete his route if he adds 20 more customers in his neighborhood? Write and solve a proportion to find the answer, and include units with your answer.

$$40 + 20 = 60 \text{ customers}$$

$$\frac{50 \text{ minutes}}{40 \text{ customers}} = \frac{x \text{ min}}{60 \text{ customers}}$$

↘
•1.5

$$x = 50 \cdot 1.5 = \boxed{75 \text{ minutes}}$$

4. Bulky Store normally charges \$4.99 for a frozen pizza, but Bulky is having a sale for 25% off. Streamline Market normally charges \$3.49 for a frozen pizza, but Streamline is having a sale for 15% off. Which store offers the better price, after the discount? Write and solve proportions to find the answer, and include units with your answer.

$$\frac{\$4.99}{100\%} = \frac{\$x}{75\%}$$

↘
•0.75

$$x = 4.99 \cdot 0.75 = \$3.7425 \text{ at Bulky}$$

$$\frac{\$3.49}{100\%} = \frac{\$x}{85\%}$$

↘
•0.85

$$x = 3.49 \cdot 0.85 = \$2.9665 \text{ at Streamline}$$

Streamline has the better price.