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Chapter 6 - Ratio, Proportion, and Functions - Mid-Chapter Quiz: Lessons 6-1 through 6-4

1. **CLASSES** Tyson's math class has 12 boys and 8 girls. What is the ratio of boys to girls?

$$\frac{12}{8} = \frac{12 \div 4}{8 \div 4}$$
$$= \frac{3}{2}$$

$\frac{3}{2}$

2. **SALES** At a bake sale, 15 cookies and 40 brownies were sold. What is the ratio of cookies to brownies?

$$\frac{15}{40} = \frac{15 \div 5}{40 \div 5}$$
$$= \frac{3}{8}$$

$\frac{3}{8}$

Write each rate as a unit rate.

3. 171 miles in 3 hours

$$\frac{171 \text{ miles}}{3 \text{ hours}} = \frac{57 \text{ miles}}{1 \text{ hour}}$$ (+3 above, +3 below)

or 57 miles per hour

$\frac{57 \text{ mi}}{1 \text{ h}}$

4. $15 for 3 pounds

$$\frac{\$15}{3 \text{ pounds}} = \frac{\$5}{1 \text{ pound}}$$ (+3 above, +3 below)

or $5 per pound

$\frac{\$5}{1 \text{ lb}}$

5.

TEST PRACTICE A hockey team made four of their 10 attempted goals. Which ratio compares the number of goals made to the number of goals attempted?

A $\frac{4}{5}$

B $\frac{3}{5}$

C $\frac{5}{2}$

D $\frac{2}{5}$

$$\frac{4}{10} = \frac{4 \div 2}{10 \div 2}$$

$$= \frac{2}{5}$$

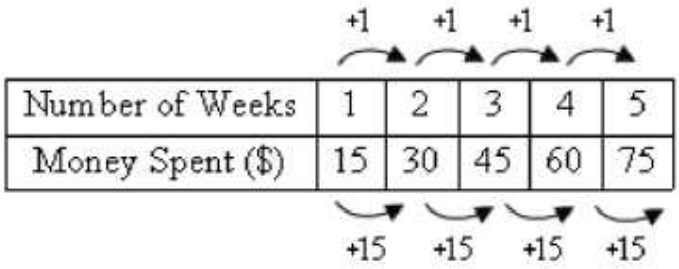
The answer is D.

D

Use the ratio tables given to solve each problem.

6. **MONEY** Peyton spends \$15 on lunch every week. At this rate, how much money will he spend in 5 weeks?

Number of Weeks	1				5
Money Spent (\$)	15				■



Peyton will spend \$75 in 5 weeks.

\$75

7. **DISHES** Charlee washes 10 dishes in 8 minutes. At this rate, how long will it take her to wash 25 dishes?

Number of Dishes	10		25
Number of Minutes	15		■

		÷2	×5
Number of Dishes	10	5	25
Number of Minutes	8	4	20
		÷2	×5

Charlie will take 20 minutes to wash 25 dishes.

20 min

Determine if the quantities in each pair of ratios or rates are proportional. Explain your reasoning and express each proportional relationship as a proportion.

8. $4 for 12 doughnuts; $9 for 36 doughnuts

Find the unit rates.

$$\frac{\$4}{12 \text{ doughbuts}} = \frac{(\$4) \div 4}{(12 \text{ doughnuts}) \div 4}$$

$$= \frac{\$1}{3 \text{ doughnuts}}$$

$$\frac{\$9}{36 \text{ doughbuts}} = \frac{(\$9) \div 9}{(36 \text{ doughnuts}) \div 9}$$

$$= \frac{\$1}{4 \text{ doughnuts}}$$

No; since the unit rates are not the same, the rates are not proportional.

No; Since the unit rates, $\frac{\$1}{3 \text{ doughnuts}}$ and $\frac{\$1}{4 \text{ doughnuts}}$, are not the same, the rates are not equivalent.

9. 24 pages read in 8 minutes; 72 pages read 24 minutes

Find the unit rates.

$$\frac{24 \text{ pages}}{8 \text{ min}} = \frac{(24 \text{ pages}) \div 8}{(8 \text{ min}) \div 8}$$

$$= \frac{3 \text{ pages}}{1 \text{ min}}$$

$$\frac{72 \text{ pages}}{24 \text{ min}} = \frac{(72 \text{ pages}) \div 24}{(24 \text{ min}) \div 24}$$

$$= \frac{3 \text{ pages}}{1 \text{ min}}$$

The unit rates are the same. Therefore, the rates are proportional.

$$\frac{24 \text{ pages}}{8 \text{ min}} = \frac{72 \text{ pages}}{24 \text{ min}}$$

Yes; Since $\frac{24 \text{ pages} \cdot 3}{8 \text{ min} \cdot 3} = \frac{72 \text{ pages}}{24 \text{ min}}$, the rates are proportional.

10. 48 out of 64 students own cell phones; 192 out of 258 own cell phones

Write in simplest form.

$$\frac{48}{64} = \frac{48 \div 16}{64 \div 16}$$

$$= \frac{3}{4}$$

$$\frac{192}{258} = \frac{192 \div 6}{258 \div 6}$$

$$= \frac{32}{43}$$

The ratios are not proportional.

No; Since the unit rates, $\frac{48 \text{ students}}{64 \text{ students}}$ and $\frac{192 \text{ students}}{258 \text{ students}}$, are not equivalent, the rates are not proportional.

11. **MULTIPLE CHOICE** The ratio of brown tiles to tan tiles in a mosaic is 2 to 3. Which of these shows the possible numbers of brown tiles and tan tiles in the mosaic?

F 16 brown tiles, 24 tan tiles
G 14 brown tiles, 20 tan tiles
H 12 brown tiles, 19 tan tiles
J 8 brown tiles, 9 tan tiles

$$\frac{2}{3}=\frac{2\times 8}{3\times 8} \qquad \frac{2}{3}=\frac{2\times 7}{3\times 7}$$
$$=\frac{16}{24} \qquad =\frac{14}{21}$$

$$\frac{2}{3}=\frac{2\times 6}{3\times 6} \qquad \frac{2}{3}=\frac{2\times 4}{3\times 4}$$
$$=\frac{12}{18} \qquad =\frac{8}{12}$$

The answer is F.

F

Solve each proportion.

12. $\frac{x}{6}=\frac{12}{18}$

Since $18\div 3=6$, divide the numerator and the denominator by 3.

$$\frac{12}{18}=\frac{12\div 3}{18\div 3}$$
$$=\frac{4}{6}$$

$x=4$

4

13. $\frac{8}{20}=\frac{30}{x}$

Write in simplest form.

$$\frac{8}{20}=\frac{8\div 4}{20\div 4}$$
$$=\frac{2}{5}$$

Since $2\times 15=30$, multiply the numerator and the denominator by 15.

$$\frac{2}{5}=\frac{2\times 15}{5\times 15}$$
$$=\frac{30}{75}$$

$x=75$

75

14. $\frac{3}{d}=\frac{9}{15}$

Since $9 \div 3 = 3$, divide the numerator and the denominator by 3.

$$\frac{9}{15} = \frac{9 \div 3}{15 \div 3}$$

$$= \frac{3}{5}$$

$d = 5$

5

15. $\frac{24}{72} = \frac{x}{6}$

Since $72 \div 12 = 6$, divide the numerator and the denominator by 12.

$$\frac{24}{72} = \frac{24 \div 12}{72 \div 12}$$

$$= \frac{2}{6}$$

$x = 2$

2

16. **MULTIPLE CHOICE** Cristina made 4 bracelets in 36 minutes. At this rate, how many bracelets would she make in 108 minutes?

A 8
B 9
C 12
D 16

Let x be the number of bracelets that Cristina can make in 108 minutes.

$$\frac{4}{36} = \frac{x}{108}$$

Since $36 \times 3 = 108$, multiply the numerator and the denominator by 3.

$$\frac{4}{36} = \frac{4 \times 3}{36 \times 3}$$

$$= \frac{12}{108}$$

$x = 12$

The answer is C.

C

17. **ACTIVITIES** Suppose 8 out of 24 students in a classroom participate in after-school activities. At the same rate, predict how many students in a school of 960 can be expected to participate in after-school activities.

Let p be the number of the 960 people who participate in after-school activities.

$$\frac{8}{24} = \frac{p}{960}$$

Since $24 \times 40 = 960$, multiply the numerator and the denominator by 40.

$$\frac{8}{24} = \frac{8 \times 40}{24 \times 40}$$

$$= \frac{320}{960}$$

$p = 320$

320 people out of 960 can be expected to participate in after-school activities.

320