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M7A Chapter 5 Practice Test

For Exercises 1 and 2, refer to the table below.
The table shows the heart rates and masses of different animals.

Animal	Heart Rate (beats/min)	Mass (g)
cat	150	2000
cow	66	800,000
hamster	450	60
horse	44	1,200,000

1. Express the ratio of a cow's heart rate to a hamster's heart rate as a fraction in simplest form.

$\frac{66}{450} = \frac{33}{225} = \frac{11}{75}$

1. $\frac{11}{75}$

2. Express the ratio of the mass of a cat to the mass of a cow as a fraction in simplest form.

$\frac{2000}{800{,}000} = \frac{2}{800} = \frac{1}{400}$

2. $\frac{1}{400}$

3. A 4-gallon jug of milk costs \$5.60. At what price should a $\frac{1}{2}$-gallon jug be sold in order for the unit rate for both containers to be the same?

$\frac{5.60}{4} = \frac{1.40}{1} = \frac{0.70}{\frac{1}{2}}$

3. \$0.70

4. A boat dock measures 14 meters in length. Use a conversion factor to write this length to the nearest tenth of a foot. (~~1 meter~~ = ~~3.28 feet~~) (1 foot = 0.3 meters)

$\frac{ft}{m}$ $\quad \frac{1}{0.3} = \frac{x}{14}$ $\quad 14(1) = 0.3x$ $\quad 14 = 0.3x$ $\quad \frac{14}{0.3} =$

4. 46.7

5. Auggie began working on a computer program. After $7\frac{1}{5}$ hours, he had completed $20\frac{1}{10}$ lines of code. What was his unit rate of programming in lines of code per hour?

$\frac{20.1}{7.2} = 2.79 \approx 2.8$

$\frac{20\frac{1}{10}}{7\frac{1}{5}} = \frac{\frac{201}{10}}{\frac{36}{5}} = \frac{67}{\frac{201}{10}} \cdot \frac{5}{36} = \frac{67}{24} = 2\frac{19}{24}$ LINES/HR

$2\frac{19}{24}$ LINES/HR

5. 2.8 LINES/HR

6. Joel works as an auditor and earns \$36,920 per year. What is Joel's weekly earnings?

$\frac{36920}{52} = \$710$

6. \$710

7. Is the following statement true or false? Explain your reasoning.

TRUE $\quad \frac{\frac{3}{4}}{\frac{2}{16}} = \frac{36}{6}$ $\quad \frac{3}{4} \cdot \frac{16}{2} = \frac{6}{1} \cdot \frac{6}{6} = \frac{36}{6}$

7. TRUE

8. Write and solve a proportion to solve for x.

3 ounces of perfume for \$105
7 ounces of perfume for x

$\frac{3}{105} = \frac{1}{35} \cdot \frac{7}{7} = \frac{7}{245}$

$\frac{3}{105} + \frac{3}{105} = \frac{6}{210}$

$\frac{6}{210} + \frac{1}{35}$

8. \$245

9. Ryan is building a model of the Texas Capitol Building. He is using a scale of 2 inches = 5 meters. What is the height of the model if the Texas Capitol Building is 95 meters high?

$\frac{5m}{2in} = \frac{95m}{x}$ $\quad \frac{95(2)}{5} = \frac{190}{5} = 38$

$5(20) = 100$
$5(19) = 95$

$2(19) = 38$ ↑

9. 38 in

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For Exercises 10 and 11, determine whether the set of numbers in each table is proportional. If the relationship is proportional, determine the constant of proportionality.

10.

Birds	1	2	3	4
Beaks	1	2	3	4

10. PROPORTIONAL

11.

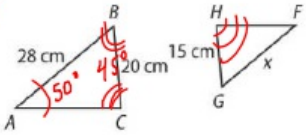
Number of Pizzas	2	4	6	8
Number of Slices	16	32	60	64

$\frac{28}{21} = \frac{20}{15} = \frac{4}{3}$

11. NON-PROPORTIONAL

For Exercises 12 and 13, $\triangle ABC \sim \triangle FGH$.

12. Find the value of x.



$\frac{28}{20} = \frac{x}{15}$

$\frac{28(15)}{20} = \frac{420}{20} = 21$

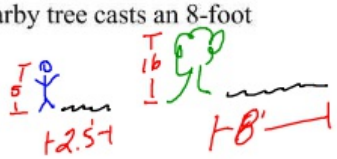
12. 21 cm

13. If $m\angle A = 50°$ and $m\angle B = 45°$, what is $m\angle H$?

$180° - 95° = 85$

13. 85°

14. At the same time a 5-foot person casts a 2.5-foot shadow, a nearby tree casts an 8-foot shadow. How tall is the tree?



14. 16 ft

15. On a set of blueprints for a house, the scale is $\frac{1}{2}$ inch = 4 feet.

a. Find the actual length of a room that measures 3.2 inches on the blueprint.

$\frac{\frac{1}{2}\text{ in}}{4\text{ ft}} = \frac{3.2\text{ in}}{x}$ $\quad \frac{3.2(4)}{0.5} = \frac{12.8}{0.5} = \frac{25.6}{1}$

b. Suppose an architect is updating the blueprints and decides to use a different scale. An actual length of 30 feet is drawn on the new blueprint as 4 inches. Complete the ratio for the new scale.

$\frac{1}{2}$ inch = ☐ feet $\quad \frac{4\text{ in}}{8} = \frac{30\text{ ft}}{8}$ ← 8 ONE HALFS IN 4

15. a) 25.6 ft
b) 3.75

16. Explain a method for determining if the relationship shown in the graph is proportional.

① ALL THE POINTS NEED TO LIE ON ONE LINE

② THE LINE NEEDS TO PASS THROUGH THE ORIGIN

16. _____