Name _____ Class _____ Date _____

Practice 1-4

Unit Rates with Fractions

1. Harry is bundling magazines to recycle. He notices that 4 magazines weigh $\frac{3}{8}$ pound in all and that the magazines all weigh the same amount. What is the unit rate for pounds per magazine?

2. Leo reads 13 pages in $\frac{1}{3}$ hour.

a) What is the unit rate for pages per hour?

b) What is the unit rate for hours per page?

3. Write the rate $\frac{\frac{1}{7}\text{ inch}}{\frac{1}{14}\text{ minute}}$ as a unit rate.

4. A bicyclist rides $\frac{1}{5}$ mile in $\frac{1}{65}$ hour. Write this rate as a unit rate.

5. Yesterday, Grace drove $38\frac{1}{2}$ miles. She used $1\frac{1}{4}$ gallons of gasoline. What is the unit rate for miles per gallon?

6. You are running a fuel economy study. One of the cars you find is blue. It can travel $35\frac{1}{2}$ miles on $1\frac{1}{4}$ gallons of gasoline. Another car is red. It can travel $27\frac{1}{5}$ miles on $\frac{4}{5}$ gallon of gasoline.

a) What is the unit rate for miles per gallon for the blue car?

b) What is the unit rate for miles per gallon for the red car?

c) Which car could travel the greater distance on 1 gallon of gasoline?

7. Writing A store sells two kinds of candles, scented and unscented. The scented candles burn $\frac{1}{8}$ inch in $\frac{1}{4}$ hour. The unscented candles burn $\frac{1}{9}$ inch in $\frac{1}{3}$ hour.

a) What is the unit rate for inches burned per hour for the scented candles?

b) What is the unit rate for inches burned per hour for the unscented candles?

c) Which kind of candle burns more in an hour?

d) Show how to find the unit rate of hours per inch for each kind of candle.

e) Explain the meaning of this unit rate.

8. **Reasoning** Hannah is making muffins. The recipe calls for $\frac{2}{3}$ cup of milk to make 8 muffins.

   a) What is the unit rate for cups of milk per muffin?

   b) What is the unit rate for muffins per cup of milk?

   c) Show or describe at least two ways to find the unit rate for muffins per cup of milk.

9. **Error Analysis** Henry incorrectly said the rate $\frac{\frac{1}{5} \text{ pound}}{\frac{1}{20} \text{ quart}}$ can be written as the unit rate $\frac{1}{100}$ pound per quart.

   a) What is the correct unit rate?

   b) What was Henry's likely error?

   ❍ A. He multiplied both terms by the numerator. He should have multiplied both terms by the denominator.

   ❍ B. He divided both terms by the numerator. He should have divided both terms by the denominator.

   ❍ C. He divided both terms by the denominator. He should have multiplied both terms by the denominator.

   ❍ D. He multiplied both terms by the denominator. He should have divided both terms by the denominator.

10. **Yardwork** Last weekend, Charlie raked leaves in his front yard. He noticed that $\frac{7}{3}$ kilograms of leaves filled $\frac{4}{9}$ of a bag. What is the unit rate for kilograms of leaves per bag?

11. **Open-Ended** Graham drove $42\frac{1}{3}$ miles in $1\frac{1}{3}$ hours.

    a) What is the unit rate for miles per hour?

    b) Describe a situation in which the unit rate would be easier to work with than the given rate.

12. A robot can complete 8 tasks in $\frac{5}{6}$ hour.

    a) What is the unit rate for hours per task?

    b) What is the unit rate for tasks per hour?

    c) Explain why it might be important to know each of these unit rates.

13. A certain blueprint shows two fences. Fence A is $1\frac{1}{2}$ feet long but is $1\frac{4}{5}$ inches long on the blueprint.

    a) What is the unit rate for inches per foot on this blueprint?

    b) If fence B is 5 feet long, how long is fence B on the blueprint?

14. **Challenge** Josh plans to make birdhouses to sell at a craft fair. He has a sample of the wood he wants to use. The sample has area $\frac{1}{5}$ square foot and weighs $\frac{1}{2}$ pound. The local hardware store sells the wood only by the square yard. There are 9 square feet in 1 square yard.

a) What is the unit rate for pounds of the wood per square yard?

b) If Josh needs 3 square yards of the wood in all, how many pounds of the wood does he need?

15. **Challenge** Yesterday, Noah ran $2\frac{1}{2}$ miles in $\frac{3}{5}$ hour. Emily ran $3\frac{3}{4}$ miles in $\frac{5}{6}$ hour. Anna ran $3\frac{1}{2}$ miles in $\frac{3}{4}$ hour.

a) What was the unit rate for miles per hour for Noah?

b) What was the unit rate for miles per hour for Emily?

c) What was the unit rate for miles per hour for Anna?

d) Who ran the fastest?

e) Describe two ways you can find who ran the fastest.

*Practice 1-4: **Unit Rates with Fractions***

1. $\frac{3}{32}$

2. a) 39 pages/hr

b) $\frac{1}{39}$ hr/page

3. 2 in./min

4. 13 mi/hr

5. $30\frac{4}{5}$ mi/gal

6. a) $28\frac{2}{5}$ mi/gal

b) 34 mi/gal

c) red

7. a) $\frac{1}{2}$ in./hr

b) $\frac{1}{3}$ in./hr

c) scented

d) Answers will vary

8. a) $\frac{1}{12}$ c of milk/muffin

b) 12 muffins/c of milk

c) Answers will vary

9. a) 4 lb/qt

b) D

10. $5\frac{1}{4}$ kg/bag

11. a) $31\frac{3}{4}$ mi/hr

b) Answers will vary

12. a) $\frac{5}{48}$ hr/task

b) $9\frac{3}{5}$ tasks/hr

c) Answers will vary

13. a) $1\frac{1}{5}$ in./ft

b) Fence B is 6 in. long on the blueprint.

14. a) $22\frac{1}{2}$ lb of the wood/yd^2

b) $67\frac{1}{2}$ lb of the wood in all

15. a) Noah was $4\frac{1}{6}$ mi/hr.

b) Emily was $4\frac{1}{2}$ mi/hr.

c) Anna was $4\frac{2}{3}$ mi/hr.

d) Anna ran the fastest.

e) Answers will vary