NAME _____ DATE _____

9-1 Ratios and Rates (Pages 432–436)

A **ratio** is a comparison of two numbers by division. The ratio of the number 2 to the number 3 can be written in these ways: 2 to 3, 2:3, or $\frac{2}{3}$. Ratios are often expressed as fractions in simplest form or as decimals.

Rates	A **rate** is a special ratio that compares two measurements with different units of measure, such as miles per gallon or cents per pound. A rate with a denominator of 1 is called a **unit rate**.

EXAMPLE

Jane buys 6 cans of soda for \$1.74. Express this as a unit rate for 1 soda.

First write the ratio as a fraction: $\frac{\$1.74}{6 \text{ sodas}}$. Then divide the numerator and denominator by 6.

$$\frac{\$1.74}{6 \text{ cans}} \overset{\div 6}{=} \frac{\$0.29}{1 \text{ can}}$$

Thus, one can of soda costs \$0.29.

Try These Together

1. Express the ratio 2 to 28 as a fraction in simplest form.

2. Express the ratio \$210 for 5 nights as a unit rate.

PRACTICE

Express each ratio or rate as a fraction in the simplest form.

3. 10:35

4. 60:20

5. 3 to 39

6. 8 out of 14

7. 18 boys to 15 girls

8. 16 blue to 4 green

Express each ratio as a unit rate.

9. 294 miles on 10 gallons

10. \$0.72 for 12 ounces

11. \$3.88 for 2 pounds

12. 3.4 inches of rain in 2 months

13. 200 meters in 23.5 seconds

14. \$21 for a half dozen roses

15. \$60 for 8 movie tickets

16. 6 limes for \$2

17. Consumer Awareness You are trying to decide whether to buy a package of 20 yellow pencils for \$1.25 or a package of 15 rainbow pencils for \$1.09. Which one is a better buy and why?

18. **Standardized Test Practice** The temperature increased 12¡F in 48 hours. How can the temperature increase be described with a unit rate?

A $\frac{10¡F}{40 \text{ hr}}$ **B** $\frac{1¡F}{4 \text{ hr}}$ **C** $\frac{0.25¡F}{\text{hr}}$ **D** $\frac{1¡F}{0.25 \text{ hr}}$

Answers: **1.** $\frac{1}{14}$ **2.** \$42/night **3.** $\frac{2}{7}$ **4.** 3 **5.** $\frac{1}{13}$ **6.** $\frac{4}{7}$ **7.** $\frac{6}{5}$ **8.** 4 **9.** 29.4 mi/gal **10.** \$0.06/oz **11.** \$1.94/lb **12.** 1.7 in./mo **13.** about 8.5 m/sec **14.** \$3.50 per rose **15.** \$7.50 per ticket **16.** 3 limes per dollar **17.** 20 yellow pencils because they cost about \$0.06 each and the 15 rainbow pencils cost about \$.07 each **18.** C