EMA
Ratios and Proportions

Name Key
Date _____ Period _____

Ratios and Proportions

RATIO (RATE): A comparison of 2 numbers by division.

Ways to Write a Ratio (Rate)

- a *to* b
- $a : b$ where b is not equal to 0.
- $\frac{a}{b}$

UNIT RATE: A rate where $b = 1$ or when the denominator = 1.

Find the unit rate.

1. If you work 6 hours and make a total of $54, how much do you make per hour?

$\frac{\$54}{6 \text{ HOURS}} = \boxed{\$9/\text{HOUR}}$

2. Mr. Lee gives way too much homework. In the next 4 weeks, he plans to give 524 problems to his Expanded Math classes. How many homework problems is that per week?

$\frac{524 \text{ PROBLEMS}}{4 \text{ WEEKS}} = \boxed{131 \text{ PROBLEMS/WEEK}}$

3. A 10-ounce bottle of shampoo costs $2.40. What is the cost per ounce?

$\frac{\$2.40}{10 \text{ OZ}} = \boxed{\$0.24/\text{OZ}}$

PROPORTIONS: An equation that states 2 ratios are equal.

Determine if the 2 ratios are proportional.

4. $\frac{8}{24} \not= \frac{16}{48}$

$24(16) = 8(48)$

$384 = 384$

YES

5. $\frac{5}{10} \not= \frac{6}{3}$

$10(6) = 5(3)$

$60 = 15$

NO

6. $\frac{10}{30} \not= \frac{4}{12}$

$30(4) = 10(12)$

$120 = 120$

YES

Solve each proportion by finding the value of x.

7. $\frac{x}{24} = \frac{1}{3}$

$24 = 3x$

$8 = x$

8. $-\frac{3}{x} = \frac{6}{10}$

$6x = -3(10)$

$6x = -30$

$x = -5$

9. $\frac{6}{8} = \frac{21}{x}$

$8(-21) = 6x$

$-168 = 6x$

$-28 = x$

10. $-\frac{5}{8} = \frac{7}{x}$

$-8(7) = 5x$

$-56 = 5x$

$-11.2 = x$

11. $\frac{2}{1.2} = \frac{5}{x}$

$1.2(5) = 2x$

$6 = 2x$

$3 = x$

12. $\frac{11}{18} = -\frac{x}{49.5}$

$18x = 11(-49.5)$

$18x = -544.5$

$x = -30.25$

13. $\frac{(x+2)}{14} = \frac{5}{10}$

$14(5) = 10(x+2)$

$70 = 10x + 20$

$50 = 10x$

$5 = x$

14. $\frac{9x}{(x+12)} = \frac{9}{5}$

$9(x+12) = 5(9x)$

$9x + 108 = 45x$

$108 = 36x$

$3 = x$

15. $\frac{(18+x)}{3} = \frac{(14-x)}{7}$

$3(14-x) = 7(18+x)$

$42 - 3x = 126 + 7x$

$-84 = 10x$

$-8.4 = x$

16. $\frac{(2x-2)}{14} = \frac{(2x-4)}{6}$

$14(2x-4) = 6(2x-2)$

$28x - 56 = 12x - 12$

$14x = 44$

$x = 2.75$

17. $\frac{6}{(x+2)} = \frac{12}{(x-1)}$

$12(x+2) = 6(x-1)$

$12x + 24 = 6x - 6$

$6x = -30$

$x = -5$

18. $-\frac{(x+8)}{10} = -\frac{(x-3)}{2}$

$-2(x+8) = -10(x-3)$

$-2x - 16 = -10x + 30$

$8x = 46$

$x = 5.75$