Algebra 2 Worksheet Name: Key

Section 8.2 – Multiplying and Dividing Rational Expressions DAY 2 Period: ___

I. Multiply or divide. Assume that all expressions are defined.

1. $\frac{4x^2y}{9x^5y^2} \div \frac{12x}{5x^4y^5}$

$\frac{4x^2y}{9x^5y^2} \cdot \frac{5x^4y^5}{12x}$

$\frac{5x^6y^6}{27x^6y^2}$

$\frac{5x^{6-6}y^{6-2}}{27}$

$\frac{5x^0y^4}{27}$

$\frac{5y^4}{27}$

2. $\frac{2x-10}{3x-21} \div \frac{x-5}{4x-28}$

$\frac{2x-10}{3x-21} \cdot \frac{4x-28}{x-5}$

$\frac{2(x-5)}{3(x-7)} \cdot \frac{4(x-7)}{(x-5)}$

$\frac{2 \cdot 4}{3}$

$\frac{8}{3}$

3. $\frac{x^2-5x+4}{x^2+3x-28} \cdot \frac{x^2+2x-3}{x^2+10x+21}$

$\frac{(x-4)(x-1)}{(x+7)(x-4)} \cdot \frac{(x+3)(x-1)}{(x+3)(x+7)}$

$\frac{(x-1)(x-1)}{(x+7)(x+7)}$

$\frac{(x-1)^2}{(x+7)^2}$

4. $\frac{x^2+10x+16}{x^2-6x-16} \div \frac{x+8}{x^2-64}$

$\frac{x^2+10x+16}{x^2-6x-16} \cdot \frac{x^2-64}{x+8}$

$\frac{(x+8)(x+2)}{(x-8)(x+2)} \cdot \frac{(x+8)(x-8)}{(x+8)}$

$x+8$

5. $\frac{2x^2-x-6}{x^3+2x^2} \cdot \frac{x+2}{x-2}$

$\frac{(2x+3)(x-2)}{x^2(x+2)} \cdot \frac{(x+2)}{(x-2)}$

$\frac{2x+3}{x^2}$

6. $\frac{x^2}{x-1} \cdot \frac{x+1}{x+2} \div \frac{x}{x^2+x-2}$

$\frac{x^2}{x-1} \cdot \frac{x+1}{x+2} \cdot \frac{x^2+x-2}{x}$

$\frac{x^2}{(x-1)} \cdot \frac{(x+1)}{(x+2)} \cdot \frac{(x+2)(x-1)}{x}$

$x(x+1)$

II. Spiraling Review.

7. The number of times a wheel must turn, n, to cover a given distance varies inversely as the radius of the wheel, r. If $n = 10$ when $r = 14$, then find n when $r = 7$.

$n = \frac{k}{r}$ $\quad$ $n = \frac{140}{r}$

$10 = \frac{k}{14}$ $\quad$ $n = \frac{140}{7}$

$k = 140$

$n =$ 20 times

8. Determine whether the data in the table represents a direct variation, an inverse variation, or neither. Justify your answer.

x	1	2	3	4
y	2.25	4.5	6.75	9

$\frac{y}{x}$ 2.25 2.25 2.25 2.25 ✓

direct because $k = \frac{y}{x}$ is constant

9. A salesman's commission, c varies directly as his sales, s. If his commission is \$240 when his sales are \$4000, what are his sales when his commission is \$300?

$c = ks$ $\quad$ $c = 0.06s$

$240 = k \cdot 4000$ $\quad$ $300 = 0.06s$

$k = 0.06$ $\quad$ $s = \frac{300}{0.06}$

\$5000

10. Simplify $\frac{x^2 - 3x}{2x}$. Identify any x-values for which the expression is undefined.

$\frac{x(x-3)}{2x}$ ← $x \neq 0$

$\frac{x-3}{2}$, $x \neq$ 0

11. Simplify $\frac{3x^2 - 13x + 12}{2x^2 - 2x - 12}$. Identify any x-values for which the expression is undefined.

$\frac{(3x-4)(x-3)}{2(x^2 - x - 6)}$

$\frac{(3x-4)(x-3)}{2(x-3)(x+2)}$ ← $x \neq 3, -2$

$\frac{3x-4}{2(x+2)}$, $x \neq -2, 3$

12. Simplify $\frac{75 - 12x^2}{6x - 15}$. Identify any x-values for which the expression is undefined.

$\frac{-3(4x^2 - 25)}{3(2x-5)}$ ← $2x - 5 \neq 0$, $2x \neq 5$, $x \neq \frac{5}{2}$

$\frac{-3(2x-5)(2x+5)}{3(2x-5)}$

$-(2x+5)$, $x \neq \frac{5}{2}$

13. The safe load of a rectangular beam varies jointly as its width and the square of its depth. If the safe load of a beam is 1000 lb when the width is 2 in and the depth is 10 in, find its safe load when the width is 5 in and the depth is 6 in.

$L = kwd^2$

$1000 = k \cdot 2 \cdot 10^2$

$1000 = k \cdot 200$

$k = 5$

$L = 5wd^2$

$L = 5 \cdot 5 \cdot 6^2$

$L = 25 \cdot 36$

900