Algebra II **Review 8.1, 8.4-8.6** **Name:** Key **Hour:**

Tell whether x and y show direct variation, inverse variation, or neither.

$y = 2x + 3$ neither

$y = \frac{x}{3}$ direct

$x = \frac{3}{y}$ inverse

$\frac{1}{2}xy = 2$ inverse

x	1	2	3	4
y	1	4	9	16

neither

x	2	5	8	15
y	60	24	15	8

inverse

The variables x and y vary inversely. Use the given values to write an equation relating x and y. Then find y when $x = 0.5$.

$x = 4, y = 6$ $y = \frac{a}{x} \rightarrow 6 = \frac{a}{4}$ $a = 24$

Equation: $y = \frac{24}{x}$

$y = \frac{24}{0.5} = 48$

$y =$ 48

$x = \frac{4}{3}, y = \frac{3}{2}$ $y = \frac{a}{x} \rightarrow \frac{3}{2} = \frac{a}{\frac{4}{3}}$ $a = 2$

Equation: $y = \frac{2}{x}$

$y = \frac{2}{0.5}$

$y =$ 4

Simplify the rational expression, if possible.

$\frac{x^2 - 9}{x^2 + 5x + 6}$ $\frac{(x+3)(x-3)}{(x+3)(x+2)}$ $\frac{x-3}{x+2}$

$\frac{x^2 + 5x + 4}{x^2 - 16}$ $\frac{(x+4)(x+1)}{(x+4)(x-4)}$ $\frac{x+1}{x-4}$

$\frac{x^2 - 2x - 8}{x^2 + 7x + 10}$ $\frac{(x-4)(x+2)}{(x+2)(x+5)}$ $\frac{x-4}{x+5}$

Find the least common denominator.

$\frac{1}{x+4}$; $\frac{3x}{2x-3}$; $\frac{2x-5}{x^2+x-12}$ $(x+4)(x-3)$

$\frac{x-3}{x^2-2x-3}$ $(x-3)(x+1)$; $\frac{x+1}{x^2+6x+5}$ $(x+5)(x+1)$; $\frac{x+5}{x^2+7x+6}$ $(x+6)(x+1)$

$(x-3)(x+4)(2x-3)$

$(x+1)(x-3)(x+5)(x+6)$

Perform the indicated operation and simplify.

$\frac{2x^2+7x-4}{x^2-6x+9} \div \frac{x^2+8x+16}{x^2+x-2}$

$\frac{(2x-1)(x+4)}{(x-3)(x-3)} \cdot \frac{(x+2)(x-1)}{(x+4)(x+4)}$

$\frac{(2x-1)(x+2)(x-1)}{(x-3)(x-3)(x+4)}$

$\frac{3x}{x^2+3x-10} - \frac{2}{x+5}$

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

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

$\frac{x+4}{(x+5)(x-2)}$

$\frac{x^2-4}{2x+2} \cdot \frac{x^2-5x-6}{x^2-6x+8}$

$\frac{(x-2)(x+2)(x-6)(x+1)}{2(x+1)(x-4)(x-2)}$

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

$\frac{18x^2y^3}{7xy^2} \cdot \frac{14xy}{12x^4}$

$\frac{2 \cdot 3^2 \cdot 7 x^3 y^{+2}}{2^2 \cdot 3 \cdot 7 x^{+2} y^2}$

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

$(x-1)\ \frac{x+4}{x^2+2x+1} + \frac{x}{x^2-1} - \frac{2}{x-1} \cdot \frac{(x+1)(x+1)}{(x+1)(x+1)}$

$(x-1)\ (x+1)(x+1) \quad (x+1)(x-1)(x+1)$

$\frac{x^2+3x-4+x^2+x-2x^2-4x-2}{(x+1)(x+1)(x-1)}$

$\frac{-6}{(x+1)^2(x-1)}$

$\frac{12y^3}{5x^2y} \div \frac{3xy}{4x^3y^2}$

$\frac{2^4 \cdot 3 x^3 y^{+3}}{3 \cdot 5 x^3 y^2}$

$\frac{16y^3}{5}$

Simplify the complex fraction.

$$\frac{\frac{1}{2}+\frac{2}{x-6}}{\frac{3x-6}{x^2-12x+36}} \cdot \frac{2(x-6)(x-6)}{2(x-6)(x-6)}$$

$(x-6)(x-6)$

$$\frac{(x-6)(x-6)+4(x-6)}{6(x-1)}$$

$$\frac{x^2-12x+36+4x-24}{6(x-2)} = \frac{x^2-8x+12}{6(x-2)}$$

$$\frac{(x-6)(\cancel{x-2})}{6(\cancel{x-2})} = \boxed{\frac{x-6}{6}}$$

$$\frac{\frac{2}{x+1}+\frac{3}{x-2}}{\frac{x}{x+1}+\frac{1}{x^2-x-2}} \cdot \frac{(x-2)(x+1)}{(x-2)(x+1)}$$

$(x-2)(x+1)$

$$\frac{2(x-2)+3(x+1)}{x(x-2)+1} = \frac{2x-4+3x+3}{x^2-2x+1}$$

$$\frac{5x-1}{x^2-2x+1}$$

$$\boxed{\frac{5x-1}{(x-1)^2}}$$

Solve the equation using any method. Check for extraneous solutions!

$$2 = \frac{x+2}{x-3}$$

$$2x-6 = x+2$$

$$x = 8$$

$$\boxed{x=8}$$

$$(x-3)(x+3)\ \frac{4}{x-3}+\frac{2}{x+3} = \frac{2x-2}{x^2-9} \cdot x^2-9$$

$$4(x+3)+2(x-3) = 2x-2$$

$$4x+12+2x-6 = 2x-2$$

$$6x+6 = 2x-2$$

$$4x = -8$$

$$\boxed{x=-2}$$

$$\frac{x+1}{x-2} = \frac{x-3}{x}$$

$$x^2+x = x^2-5x+6$$

$$6x = 6$$

$$x = 1$$

$$\boxed{x=1}$$

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

$$-x^2+x+2x^2-2x = x-1$$

$$x^2-2x+1 = 0$$

$$(x-1)^2 = 0$$

$x \neq 1$ $\quad x=1$ so,

$$\boxed{\text{no solution}}$$