

$$20. \frac{5}{2y} = \frac{15y}{?}$$

$$5? = 30y^2$$

$$? = \boxed{6y^2}$$

$$22. \frac{x}{x+2} = \frac{?}{x^2-4}$$

$$?(x+2) = x(x^2-4)$$

$$?(x+2) = x(x+2)(x-2)$$

$$? = x(x-2)$$

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

$$24. \frac{x-4}{x+5} = \frac{x^2-x-12}{?}$$

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

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

$$? = (x+3)(x+3)$$

$$? = \boxed{x^2 + 6x + 9}$$

58.

$$\frac{x^2 - y^2}{2xy} = \frac{x^2 - y^2}{2xy} \cdot \frac{4x^2y}{4x^2y}$$

$$= \frac{(x^2 - y^2)2x}{y^2 - x^2} = \frac{-2x(y^2 - x^2)}{y^2 - x^2}$$

$$= -2x$$

$x \neq 0, y \neq 0$
 $x \neq y, x \neq -y$

$$60. \quad \frac{3}{x-2} + \frac{x+1}{x-2} = \frac{3+x+1}{x-2} = \frac{4+x}{x-2}$$

$$x \neq 2$$

62.

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

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

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

$$\frac{5x+10 - 2x^2 - 10x - 12 + 4x+12}{-2x^2 - x + 10} = \frac{-2x^2 + x - 10}{-2x^2 - x + 10}$$

$$= \frac{-2x-5}{x^2+5x+6}$$

$$x \neq 2, -2, -3$$

104.

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

$$\frac{xy(y+x)}{(y-x)(y+x)} = \boxed{\frac{xy}{y-x}}$$

$x \neq 0$
 $y \neq 0$
 $x \neq -y$

106.

$$\frac{2 - \frac{13}{x+5}}{2 + \frac{3}{x-3}} = \frac{\frac{2(x+5) - 13}{x+5}}{\frac{2(x-3) + 3}{x-3}} = \frac{\frac{2x-3}{x+5}}{\frac{2x-3}{x-3}}$$

$$= \frac{\cancel{2x-3}}{x+5} \cdot \frac{x-3}{\cancel{2x-3}} = \boxed{\frac{x-3}{x+5}}$$

$x \neq 3, -5$

108.

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

$$\frac{(x+h)(x+2) - x(x+h+2)}{(x+h+2)(x+2)}$$

$$\frac{\cancel{x^2} + \cancel{2x} + \cancel{hx} + 2h - \cancel{x^2} - \cancel{xh} - \cancel{2x}}{(x+h+2)(x+2)} = \frac{h}{(x+h+2)(x+2)}$$

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

$$\boxed{\frac{2}{x^2 + xh + 4x + 2h + 4}}$$

$$70. \quad \frac{1}{a} + \frac{1}{b} = \frac{\frac{b+a}{ab}}{\frac{b}{a} - \frac{a}{b}} = \frac{b+a}{ab} \cdot \frac{ab}{b^2-a^2}$$

$$\frac{\cancel{b+a}}{\cancel{(b+a)}(b-a)} = \boxed{\frac{1}{b-a}}$$

$$34. \quad \frac{75y^2}{9y} = \boxed{\frac{25}{3}y}$$

$$36. \quad \frac{2y^2 + 4y}{4y + 12} = \frac{2y(y+3)}{2 \cdot 2(y+3)} = \boxed{\frac{y}{2}}$$

$$38. \quad \frac{x^2 + 6x + 9}{x^2 - x - 12} = \frac{(x+3)(x+3)}{(x+3)(x-4)} = \boxed{\frac{x+3}{x-4}}$$