

$$19. \left(\frac{6}{x-3} = \frac{8x^2}{x^2-9} - \frac{4x}{x+3} \right) (x+3)(x-3)$$

$$6(x+3) = 8x^2 - 4x(x-3)$$

$$6x + 18 = 8x^2 - 4x^2 + 12x$$

$$6x + 18 = 4x^2 + 12x$$

$$0 = 4x^2 + 6x - 18$$

$$0 = 2(2x^2 + 3x - 9)$$

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

$$0 = 4x^2 + 6x - 18$$

$$0 = 2(2x^2 + 3x - 9)$$

$$0 = 2(2x - 3)(x + 3)$$

$$\boxed{x = 3/2} \quad \cancel{x = -3}$$

extraneous violates Domain
restriction of $x \neq -3$

$$16. f(x) = \frac{12}{x} + 9$$

$$x = \frac{12}{y} + 9$$

$$x - 9 = \frac{12}{y}$$

$$y = \frac{12}{x-9}$$

$$\boxed{f^{-1}(x) = \frac{12}{x-9}}$$

$$17. g(x) = \frac{x-3}{x+6}$$

$$x = \frac{y-3}{y+6}$$

$$x(y+6) = y-3$$

$$xy + 6x = y - 3$$

$$xy - y = -3 - 6x$$

$$y(x-1) = -3 - 6x$$

$$y = \frac{-3 - 6x}{x-1}$$

$$\boxed{f^{-1}(x) = \frac{-3 - 6x}{x-1}}$$

$$18. h(x) = \frac{8}{x-3}$$

$$x = \frac{8}{y-3}$$

$$x(y-3) = 8$$

$$xy - 3x = 8$$

$$xy = 8 + 3x$$

$$y = \frac{8 + 3x}{x}$$

$$\boxed{f^{-1}(x) = \frac{8 + 3x}{x}}$$

$$19. f(x) = \frac{2}{x} + 1$$

vertical stretch by 2
up 1

