

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

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

$$x(y-1) = 3y+2$$

$$xy - x = 3y + 2$$

$$xy - 3y = x + 2$$

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

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

$$D: (-\infty, 1) \cup (1, \infty)$$

$$R: \underline{(-\infty, 3) \cup (3, \infty)}$$

$$D: (-\infty, 3) \cup (3, \infty)$$

$$11) f(x) = \frac{x}{x+2}$$

$$x = \frac{y}{y+2}$$

$$x(y+2) = y$$

$$xy + 2x = y$$

$$xy - y = -2x$$

$$y(x-1) = -2x$$

$$f^{-1}(x) = \frac{-2x}{x-1}$$

$$12) f(x) = \frac{2x+3}{5x+4}$$

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

$$x(5y+4) = 2y+3$$

$$\underline{5xy + 4x = 2y + 3}$$

$$5xy - 2y = 3 - 4x$$

$$y(5x-2) = 3-4x$$

$$f^{-1}(x) = \frac{3-4x}{5x-2}$$

$$\rightarrow 4x-3 = 2y-5xy$$

$$4x-3 = y(2-5x)$$

$$f^{-1}(x) = \frac{4x-3}{2-5x}$$

$$18) f(x) = -3x + 5$$

$$g(x) = \frac{x-5}{-3}$$

$$f(g(x)) = -3 \left(\frac{x-5}{-3} \right) + 5$$

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

x

$$g(f(x)) = \frac{-3x+5-5}{-3}$$

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

$$= x$$