$$f(x) = \frac{3}{5x-10}$$

$$y = \frac{3}{5x-10}$$

$$5xy - 10y = 3$$

$$5xy = 3 + 10y$$

$$x = \frac{3 + 10y}{5y}$$

$$\boxed{f^{-1}(x) = \frac{3 + 10x}{5x}}$$

$$f(x) = -\sqrt[3]{3x-6} + 12$$

$$y = -\sqrt[3]{3x-6} + 12$$

$$y - 12 = -\sqrt[3]{3x-6}$$

$$12 - y = \sqrt[3]{3x-6}$$

$$(12-y)^3 = 3x-6$$

$$(12-y)^3 + 6 = 3x$$

$$\frac{(12-y)^3 + 6}{3} = x$$

$$\boxed{f^{-1}(x) = \frac{(12-x)^3 + 6}{3}}$$

25-36 ■ Use la Propiedad de la Función Inversa para demostrar que f y g son inversas entre sí.

25. $f(x) = x - 6$; $g(x) = x + 6$

26. $f(x) = 3x$; $g(x) = \dfrac{x}{3}$

27. $f(x) = 2x - 5$; $g(x) = \dfrac{x + 5}{2}$

28. $f(x) = \dfrac{3 - x}{4}$; $g(x) = 3 - 4x$

Composicion

$$(f \circ g)(x) = x$$

$$f(g(x)) = x$$

㉕
$$f(g(x)) = x$$
$$f(x+6)$$
$$(x+6) - 6$$
$$\boxed{x = x \checkmark}$$

㉖
$$f(g(x)) = x$$
$$f\left(\frac{x}{3}\right)$$
$$3\left(\frac{x}{3}\right)$$
$$\boxed{x = x}$$

㉗
$$f(g(x)) = x$$
$$f\left(\frac{x+5}{2}\right)$$
$$2\left(\frac{x+5}{2}\right) - 5$$

㉘
$$f(g(x)) = x$$
$$f(3 - 4x)$$
$$\frac{3 - (3-4x)}{4}$$

$$\frac{2x+10}{2}$$

$$\frac{2x+10-10}{2}$$

$$x = x$$

$$\boxed{x = x}$$

---

29. $f(x) = \dfrac{1}{x}$; $\quad g(x) = \dfrac{1}{x}$

30. $f(x) = x^5$; $\quad g(x) = \sqrt[5]{x}$

31. $f(x) = x^2 - 4$, $\quad x \geq 0$;
$\quad g(x) = \sqrt{x+4}$, $\quad x \geq -4$

32. $f(x) = x^3 + 1$; $\quad g(x) = (x-1)^{1/3}$

33. $f(x) = \dfrac{1}{x-1}$, $\quad x \neq 1$; $\quad g(x) = \dfrac{1}{x} + 1$, $\quad x \neq 0$

34. $f(x) = \sqrt{4-x^2}$, $\quad 0 \leq x \leq 2$;
$\quad g(x) = \sqrt{4-x^2}$, $\quad 0 \leq x \leq 2$

35. $f(x) = \dfrac{x+2}{x-2}$; $\quad g(x) = \dfrac{2x+2}{x-1}$

36. $f(x) = \dfrac{x-5}{3x+4}$; $\quad g(x) = \dfrac{5+4x}{1-3x}$

---

29) $f(g(x)) = x$

$f\left(\frac{1}{x}\right)$

$\left(\dfrac{\frac{1}{1}}{\frac{1}{x}}\right)$

$\boxed{x = x}$

30) $f(g(x)) = x$

$f\left(\sqrt[5]{x}\right) = x$

$\left(\sqrt[5]{x}\right)^5 = x$

$\boxed{x = x}$

31) $f(g(x)) = x$

$f\left(\sqrt{x+4}\right)$

$\left(\sqrt{x+4}\right)^2 - 4$

$x + 4 - 4$

$\boxed{x = x}$

32) $f(g(x)) = x$

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

$\left((x-1)^{\frac{1}{3}}\right)^3 + 1$

$x - 1 + 1$

$\boxed{x = x}$

33) $f(g(x)) = x$

$f\left(\frac{1}{x} + 1\right)$

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

$\left(\dfrac{\frac{1}{1}}{\frac{1}{x}}\right)$

$\boxed{x = x}$

34) $f(g(x)) = x$

$f\left(\sqrt{4-x^2}\right)$

$\sqrt{4 - \left(\sqrt{4-x^2}\right)^2}$

$\sqrt{4 - 4 - x^2}$

$\sqrt{x^2}$

$\boxed{x = x}$

35) $f(g(x)) = x$

$f\left(\frac{2x+2}{x-1}\right)$

$\dfrac{\frac{2x+2}{x-1} + 2}{}$

36) $f(g(x)) = x$

$f\left(\frac{5+4x}{1-3x}\right)$

$\dfrac{\frac{5+4x}{1-3x} - 5}{}$

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

$$3\left(\frac{5+9x}{7-3x}\right)+4$$

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

$$\frac{\frac{5+9x-5+15x}{7-3x}}{\frac{15+12x}{7-3x}+4}$$

$$\frac{4x}{4} \Rightarrow \boxed{X=X}$$

$$\frac{\frac{5+9x-5+15x}{7-3x}}{\frac{15+12x+4-12x}{7-3x}}$$

$$\frac{79x}{79} \Rightarrow \boxed{X=X}$$

37-60 ■ Encuentre la función inversa de *f*.

37. $f(x) = 2x + 1$ **38.** $f(x) = 6 - x$

39. $f(x) = 4x + 7$ **40.** $f(x) = 3 - 5x$

41. $f(x) = 5 - 4x^3$ **42.** $f(x) = \dfrac{1}{x^2}, \quad x > 0$

43. $f(x) = \dfrac{1}{x + 2}$ **44.** $f(x) = \dfrac{x - 2}{x + 2}$

45. $f(x) = \dfrac{x}{x + 4}$ **46.** $f(x) = \dfrac{3x}{x - 2}$

47. $f(x) = \dfrac{2x + 5}{x - 7}$ **48.** $f(x) = \dfrac{4x - 2}{3x + 1}$

49. $f(x) = \dfrac{1 + 3x}{5 - 2x}$ **50.** $f(x) = \dfrac{2x - 1}{x - 3}$

37) $y = 2x + 1$

$y - 1 = 2x$

$\dfrac{y-1}{2} = x$

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

38) $y = 6 - x$

$y - 6 = -x$

$6 - y = x$

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

39) $y = 4x + 7$

$y - 7 = 4x$

$\dfrac{y-7}{4} = x$

$\boxed{f^{-1}(x) = \dfrac{x-7}{4}}$

40) $y = 3 - 5x$

$y - 3 = -5x$

$\dfrac{-(3-y)}{-(5)} = x$

$\dfrac{3-y}{5} = x$

$\boxed{f^{-1}(x) = \dfrac{3-x}{5}}$

41) $y = 5 - 4x^3$

$y - 5 = -4x^3$

$\dfrac{5-y}{4} = x^3$

$3\sqrt{\dfrac{5-y}{}} = x$

42) $y = \dfrac{1}{x^2}$

$x^2 y = 1$

$x^2 = \dfrac{1}{y}$

$x = \sqrt{\dfrac{1}{y}}$

$\boxed{f^{-1}(x) = \dfrac{1}{}}$

43) $y = \dfrac{1}{x+2}$

$xy + 2y = 1$

$xy = 1 - 2y$

$x = \dfrac{1-2y}{y}$

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

44) $y = \dfrac{x-2}{x+2}$

$xy + 2y = x - 2$

$xy - x = -2 - 2y$

$x(y-1) = \dfrac{-2-2y}{y-1}$

$x = \dfrac{+(2+2y)}{+(1-y)}$

$x = \dfrac{2+2y}{1-y}$

$\boxed{f^{-1}(x) = \dfrac{2+2x}{1-x}}$

45) $y = \dfrac{x}{x+4}$

$xy + 4y = x$

$xy - x = -4y$

$x(y-1) = -4y$

$x = \dfrac{-4y}{y-1}$

$x = \dfrac{+(4y)}{+(-y+1)}$

$x = \dfrac{4y}{1-y}$

$\boxed{f^{-1}(x) = \dfrac{4x}{1-x}}$

46) $y = \dfrac{3x}{x-2}$

$xy - 2y = 3x$

$xy - 3x = 2y$

$x(y-3) = 2y$

$x = \dfrac{2y}{y-3}$

$\boxed{f^{-1}(x) = \dfrac{2x}{x-3}}$

47) $y = \dfrac{2x+5}{x-7}$

$xy - 7y = 2x+5$

$xy - 2x = 7y+5$

$x(y-2) = 7y+5$

$x = \dfrac{7y+5}{y-2}$

$\boxed{f^{-1}(x) = \dfrac{7x+5}{x-2}}$

48) $y = \dfrac{4x-2}{3x+1}$

$3xy + y = 4x-2$

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

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

$x = \dfrac{-2-y}{3y-4}$

$x = \dfrac{+(2+y)}{+(4-3y)}$

$x = \dfrac{2+y}{4-3y}$

$\boxed{f^{-1}(x) = \dfrac{2+x}{4-3x}}$

49) $y = \dfrac{1+3x}{5-2x}$

$5y - 2xy = 1 + 3x$

$-2xy - 3x = 1 - 5y$

$x(-2y-3) = 1 - 5y$

$x = \dfrac{1-5y}{-2y-3}$

$x = \dfrac{+(5y-1)}{+(2y+3)}$

$x = \dfrac{5y-1}{2y+3}$

$\boxed{f^{-1}(x) = \dfrac{5x-1}{2x+3}}$

50) $y = \dfrac{2x-1}{x-3}$

$xy - 3y = 2x-1$

$xy - 2x = 3y-1$

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

$x = \dfrac{3y-1}{y-2}$

$\boxed{f^{-1}(x) = \dfrac{3x-1}{x-2}}$