**1.** (i) $f(x) = \dfrac{12}{x-2}$

$f(-4) = \dfrac{12}{-6} = -2$

$f(10) = \dfrac{12}{8} = \dfrac{3}{2}$

(ii) $f(x) = \dfrac{3}{4}$

$\dfrac{12}{x-2} = \dfrac{3}{4}$

$3(x-2) = 48$

$x - 2 = 16$

$x = 18$

**2.** $g(x) = px^2 - qx$

$g(3) = p(3)^2 - q(3)$

$9p - 3q = 12$

$3p - q = 4$ .....①

$g(4) = p(4)^2 - q(4)$

$16p - 4q = 28$

$4p - q = 7$ .....②

Dari / *From* ①: $q = 3p - 4$ .....③

Gantikan ③ ke dalam ②:
*Substitute* ③ *into* ②*:*

$4p - (3p - 4) = 7$

$4p - 3p + 4 = 7$

$p = 3$

Gantikan $p = 3$ ke dalam ③:
*Substitute* $p = 3$ *into* ③*:*

$q = 3(3) - 4$

$= 5$

**3.** (i) $g(3) = 2 - (3)^2 = -7$

$fg(3) = f(-7)$

$= 3(-7) + 2$

$= -19$

(ii) $f(4) = 3(4) + 2 = 14$

$gf(4) = g(14)$

$= 2 - (14)^2$

$= -194$

**4.** $f[g(x)] = 5x + 8$

$3g(x) - 6 = 5x + 8$

$3g(x) = 5x + 14$

$g(x) = \dfrac{5x + 14}{3}$

$\therefore\ g : x \rightarrow \dfrac{5x + 14}{3}$

**5.** $gf(x) = 8 - 3x^2$

$g(x + 2) = 8 - 3x^2$

Katakan / *Let* $y = x + 2$

$x = y - 2$

$g(y) = 8 - 3(y - 2)^2$

$= 8 - 3(y^2 - 4y + 4)$

$= 8 - 3y^2 + 12y - 12$

$= -3y^2 + 12y - 4$

$g(x) = -3x^2 + 12x - 4$

$g : x \rightarrow -3x^2 + 12x - 4$

**6.** $g(x) = 5x - 6$

$h(x) = \dfrac{3x}{x - 2}$

$gh(x) = h(x)$

$g\left(\dfrac{3x}{x - 2}\right) = \dfrac{3x}{x - 2}$

$5\left(\dfrac{3x}{x - 2}\right) - 6 = \dfrac{3x}{x - 2}$

$\dfrac{15x}{x - 2} - 6 = \dfrac{3x}{x - 2}$

$15x - 6(x - 2) = 3x$

$15x - 6x + 12 = 3x$

$6x = -12$

$x = -2$

**7.** $g(x) = mx - n$

$g(2) = m(2) - n$

$= 2m - n$

$fg(2) = 1$

$5(2m - n) + 1 = 1$

$10m - 5n + 1 = 1$

$10m = 5n$

$m = \dfrac{1}{2}n$

**8.** (i) Katakan / *Let* $f^{-1}(x) = y$

$f(y) = x$

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

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

$2y - 5 = xy + 2x$

$2y - xy = 2x + 5$

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

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

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

(ii) $f^{-1}(5) = \dfrac{2(5) + 5}{2 - 5}$

$= \dfrac{15}{-3}$

$= -5$

**9.** Biar / *Let* $y = h^{-1}(x)$

$$y = \frac{5}{x} - 2$$

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

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

Oleh sebab / *Since* $h(y) = x$,

$$h(y) = \frac{5}{y+2}$$

Gantikan $y$ dengan $x$,
*Substitute y with x,*

$$h(x) = \frac{5}{x+2}$$

$$\therefore h : x \to \frac{5}{x+2}$$

**10.** Katakan / *Let* $f^{-1}(x) = y$

$$f(y) = x$$

$$6 - 3y = x$$

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

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

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

$$= \frac{6 - \left(\frac{1}{2x-1}\right)}{3}$$

$$= \frac{6(2x-1) - 1}{3(2x-1)}$$

$$= \frac{12x-7}{6x-3}, \quad x \neq \frac{1}{2}$$