

Q4 (a)

$$f(x) = 2x + 7$$

$$g(x) = 3x - 2$$

(i) $f(-1) = 2(-1) + 7 = \boxed{5}$

$$f(0) = 2(0) + 7 = \boxed{7}$$

$$g\left(\frac{1}{3}\right) = 3\left(\frac{1}{3}\right) - 2 = \boxed{-1}$$

$$g(-4) = 3(-4) - 2 = \boxed{-14}$$

(ii) $f(x) = -5$

$$2x + 7 = -5$$

$$2x = -12$$

$$\boxed{x = -6}$$

(iii) $x \rightarrow 2x + 7$

$$x - 7 \rightarrow 2x$$

$$\frac{x - 7}{2} \rightarrow x$$

$$f^{-1}(x) = 10$$

$$\frac{x - 7}{2} = 10$$

$$x - 7 = 20$$

$$\boxed{x = 27}$$

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

$$2x + 7 = 3x - 2$$

$$7 + 2 = 3x - 2x$$

$$\boxed{9 = x}$$

(v) $f \circ g(x) + g \circ f(x) - 1$ | $f \circ g(x) - 2(3x - 2) + 7 = 6x - 4 + 7$
 $6x + 3 + 6x + 19 - 1$ | $g \circ f(x) - 3(2x + 7) - 2 = 6x + 21 - 2$
 $\boxed{12x + 21}$