

$$a - 2 = 0 \Rightarrow a = 2 \Rightarrow f(x) = 5x + b$$

$$2x + b \geq 0 \Rightarrow x \geq -\frac{b}{2} \quad -\frac{b}{2} = -3 \Rightarrow \underline{b = -6}$$

$$x^2 + 2x + 2 - m^2 \geq 0 \quad \Delta \leq 0$$

$$\Delta = b^2 - 4ac = 4 - 4(2 - m^2) = 4 - 8 + 4m^2$$

$$\Rightarrow 4m^2 - 4 \leq 0 \Rightarrow 4(m^2 - 1) \leq 0 \Rightarrow m^2 - 1 \leq 0 \Rightarrow m^2 \leq 1$$

$$\Rightarrow -1 \leq m \leq 1 \Rightarrow 1 - 1 \Rightarrow 1 - (-1) = 2$$

$$4 - x^2 \geq 0 \Rightarrow x^2 \leq 4 \Rightarrow -2 \leq x \leq 2 \quad ①$$

$$[x] + [-x] + 1 \neq 0 \Rightarrow x \in \mathbb{Z}$$

$$D_f = \{-2, -1, 0, 1, 2\}$$

$$n(D_f) = 5$$

$$a) y = x^3 + 3x^2$$

$$x^3 + 3x^2 \geq 0 \Rightarrow x^2(x + 3) \geq 0 \Rightarrow x + 3 \geq 0$$

$$\Rightarrow x \geq -3 \Rightarrow D_g = [-3, +\infty)$$

$$b) \sqrt{\frac{(x-1)(x+1)x^2(x-3)}{(x+1)(x^2+x+1)}} \Rightarrow x \neq 1 \quad ①$$

↳ ②

$$x^2(x+1)(x-3) \geq 0 \Rightarrow x \leq -1 \quad \text{یا} \quad x \geq 3$$

$$D_f = (-\infty, -1] \cup \{0\} \cup [3, +\infty)$$

$$a) |x-2| \geq 3 \Rightarrow x \geq 5 \cup x \leq -1$$

$$D_f = (-\infty, -1] \cup [5, +\infty)$$

$$b) [x-2] \leq 4 \Rightarrow -2 \leq x \leq 6$$

$$D_f = [-2, 6]$$

$$\text{ا) } x|x| \leq 1 \rightarrow x > 0 \rightarrow x(x) \leq 1 \rightarrow -1 \leq x \leq 1 \rightarrow 0 \leq x \leq 1$$

$$\rightarrow x < 0 \rightarrow x(-x) = -x^2 \leq 1 \rightarrow x^2 \geq -1$$

$$\Rightarrow D_f = [-\infty, 1]$$

$$\text{ب) } 3 - |x-5| \geq 0 \Rightarrow 2 \leq x \leq 8 \text{ ①}$$

$$\sqrt{3 - |x-5|} \neq 1 \Rightarrow 3 - |x-5| \neq 1 \Rightarrow |x-5| \neq 2 \Rightarrow x \neq 7$$

$$x \neq 3$$

$$D_f = [2, 3) \cup (3, 7) \cup (7, 8]$$

$$\text{ا) } \cos x \neq 0 \Rightarrow x \neq k\pi + \frac{\pi}{2}$$

$$D_f = \mathbb{R} - \left\{ k\pi + \frac{\pi}{2}, k \in \mathbb{Z} \right\}$$

$$\text{ب) } 2\cos x \neq 1 \Rightarrow \cos x \neq \frac{1}{2}$$

$$x \neq 2k\pi \pm \frac{\pi}{3} \Rightarrow \mathbb{R} - \left\{ 2k\pi \pm \frac{\pi}{3} \mid k \in \mathbb{Z} \right\}$$

$$\text{ا) } |2x+1| \neq |x+3| \Rightarrow 2x+1 \neq x+3 \Rightarrow x \neq 2$$

$$\Rightarrow 2x+1 \neq -(x+3) \Rightarrow 2x+1 \neq -x-3 \Rightarrow 3x \neq -4 \Rightarrow x \neq -\frac{4}{3}$$

$$D_f = \mathbb{R} - \left\{ 2, -\frac{4}{3} \right\}$$

$$\text{ب) } |2x+1| \geq |x+3| \Rightarrow (2x+1)^2 \geq (x+3)^2$$

$$4x^2 + 4x + 1 \geq x^2 + 6x + 9 \Rightarrow 3x^2 - 2x - 8 \geq 0$$

$$-\frac{4}{3} \quad 2 \quad -\frac{4}{3}$$

$$D_f = \left(-\infty, -\frac{4}{3} \right] \cup [2, +\infty)$$

$$2x-1 > 0 \Rightarrow x > \frac{1}{2} \text{ ① } \log_5 2x-1 > 0 \Rightarrow 2x-1 > 5^0$$

$$\Rightarrow 2x > 2 \Rightarrow x > 1 \text{ ②}$$

$$\log_{\frac{1}{5}} 2x-1 \Rightarrow \log_5 2x-1 \leq (0, 5) \Rightarrow \log_5 2x-1 \leq 1$$

$$2x-1 \leq 5 \Rightarrow x \leq 3 \Rightarrow D_f = (1, 3]$$

$$\text{ا) } \cos x > -\frac{1}{2} \Rightarrow D_f = \left(2k\pi - \frac{2\pi}{3}, 2k\pi + \frac{2\pi}{3} \right)$$

$$\text{ب) } \log_5 \left(\frac{x-1}{x+1} \right) \geq 0 \Rightarrow \frac{x-1}{x+1} \geq 10^0 \Rightarrow \frac{x-1}{x+1} - 1 \geq 0 \Rightarrow \frac{x-1-(x+1)}{x+1} \geq 0$$

$$\Rightarrow \frac{-2}{x+1} \geq 0 \Rightarrow x+1 < 0 \Rightarrow x < -1$$

$$D_f = (-\infty, -1)$$