

باتوجه به بازه‌ی تعریف دایره، نتیجه‌ی گیرم تابع خطی است؛ پس:

$$a-2=0 \Rightarrow a=2$$

$$2x+b \xrightarrow{x=3} 9+b=0 \Rightarrow \boxed{b=-9}$$

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$$x^2+2x+2-m^2$$

$$\Delta \leq 0 \Rightarrow 4-4+4m^2 \leq 0 \Rightarrow 4m^2-4 \leq 0 \Rightarrow m^2-1 \leq 0 \Rightarrow m^2 \leq 1 \Rightarrow -1 \leq m \leq 1$$

بیشترین کمترین

$$\rightarrow 1-(-1)=\boxed{2}$$

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$$4-x^2 \geq 0 \Rightarrow x^2 \leq 4 \Rightarrow -2 \leq x \leq 2 \Rightarrow x \in \{-2, -1, 0, 1, 2\} \rightarrow \boxed{5}$$

$$[x]+[-x]+1 = \begin{cases} \rightarrow x \in \mathbb{Z} \rightarrow 1 \\ \rightarrow x \notin \mathbb{Z} \rightarrow 0 \rightarrow 0 \end{cases}$$

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

$$\rightarrow \frac{-3}{-1+1} \Rightarrow \boxed{D_f = [-3, +\infty)}$$

ب) $\frac{(x-1)(x^2-3x^2)}{x^3-1} \geq 0 \rightarrow \frac{-1}{+1-1-1-1} \geq 0$

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

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الف) $|x-2|-3 \geq 0 \Rightarrow |x-2| \geq 3 \Rightarrow 3 \leq x-2 \leq -3 \Rightarrow 5 \leq x \leq -1$

$$\Rightarrow \boxed{D_f = (-\infty, -1] \cup [5, +\infty)}$$

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ب) $|2-x| \leq 4 \Rightarrow -4 \leq 2-x \leq 4 \Rightarrow -6 \leq -x \leq 2 \Rightarrow -2 \leq x \leq 6$

$$\Rightarrow \boxed{D_f = [-2, 6]}$$

$$\text{الف) } |x| \geq 0 \Rightarrow x \geq 0 \Rightarrow x \leq 1 \Rightarrow x \leq 1 \quad \left\{ \begin{array}{l} x > 0 \rightarrow x \leq 1 \Rightarrow x \leq 1 \\ x < 0 \rightarrow -x \leq 1 \Rightarrow x \geq -1 \end{array} \right\} \Rightarrow D_f = (-\infty, 1]$$

$$\text{ب) } |x-2| > 0 \Rightarrow |x-2| < 2 \Rightarrow -2 < x-2 < 2 \Rightarrow 0 < x < 4 \Rightarrow D_f = (0, 4)$$

$$\text{ج) } \cos x \neq 0 \Rightarrow x \neq \frac{\pi}{2}, \frac{3\pi}{2} \Rightarrow D_f = \mathbb{R} - \left\{ \frac{\pi}{2}, \frac{3\pi}{2} \right\}$$

$$\text{د) } |\cos x| \neq 1 \Rightarrow \cos x \neq \pm 1 \Rightarrow x \neq \frac{\pi}{2}, \frac{3\pi}{2} \Rightarrow D_f = \mathbb{R} - \left\{ \frac{\pi}{2}, \frac{3\pi}{2} \right\}$$

$$\text{هـ) } |x+1| - |x+3| \neq 0 \Rightarrow |x+1| \neq |x+3| \Rightarrow \begin{cases} x+1 \neq x+3 \Rightarrow x \neq -2 \\ x+1 = -x-3 \Rightarrow x = -2 \end{cases} \Rightarrow D_f = \mathbb{R} - \left\{ -2 \right\}$$

$$\begin{aligned} |x-1| > 0 &\Rightarrow x > 1 \Rightarrow x > \frac{1}{2} \text{ (I)} \\ \log_2(x-1) > 0 &\Rightarrow x-1 > 1 \Rightarrow x > 2 \Rightarrow x > 1 \text{ (II)} \\ \log_{\log_2(x-1)} > 0 &\Rightarrow \log_2(x-1) < 1 \Rightarrow x-1 < 2 \Rightarrow x < 3 \Rightarrow x < 2 \text{ (III)} \end{aligned}$$

$$\text{(I)} \cap \text{(II)} \cap \text{(III)} \Rightarrow D_f = (1, 2)$$

$$\text{و) } |\cos x + 1| > 0 \Rightarrow \cos x > -1 \Rightarrow \cos x > -\frac{1}{2} \Rightarrow D_f = \left(2k\pi - \frac{2\pi}{3}, 2k\pi + \frac{2\pi}{3} \right)$$

$$\begin{aligned} \text{ز) } \frac{x-1}{x+1} > 0 &\Rightarrow \frac{-1}{x+1} > 0 \Rightarrow x < -1 \Rightarrow x < -1 \text{ (I)} \\ \log_{\frac{x-1}{x+1}} > 0 &\Rightarrow \frac{x-1}{x+1} > 1 \Rightarrow \frac{x-1-x-1}{x+1} > 0 \Rightarrow \frac{-2}{x+1} > 0 \Rightarrow x < -1 \text{ (II)} \end{aligned}$$

$$\text{(I)} \cap \text{(II)} \Rightarrow D_f = (-\infty, -1)$$