

تکلیف شماره ۳

یازدهم رفته دد

عسل خادمی

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سوال

$$f(x) = \frac{x+3}{2x^3 - 8x + 3} \rightarrow x^5 - 3$$

صورت و مخرج را بسط می دهیم
بر $x-1$ تقسیم کرد

$$\begin{array}{r} 2x^3 + 3x^2 - 8x + 3 \quad | \quad x-1 \\ -2x^3 + 2x^2 \\ \hline 5x^2 - 8x + 3 \\ -5x^2 + 5x \\ \hline -3x + 3 \\ -(-3x + 3) \\ \hline 0 \end{array}$$

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$$\rightarrow (x-1)(2x+4)(2x-1) \rightarrow x = 1, -2, \frac{1}{2}$$

$$Df = R - \left\{ +1, -2, \frac{1}{2} \right\}$$

ب) $\frac{x+3}{2x^3 + 9x^2 + 10x + 3}$
بر $x+1$ تقسیم کرد

$$\begin{array}{r} 2x^3 + 9x^2 + 10x + 3 \quad | \quad x+1 \\ -2x^3 - 2x^2 \\ \hline 11x^2 + 10x + 3 \\ -11x^2 - 11x \\ \hline 20x + 3 \\ -20x - 20 \\ \hline 23x + 3 \end{array}$$

$$(2x+1)(2x+4)(x+1)$$

$$\rightarrow Df = R - \left\{ -\frac{1}{2}, -2, -1 \right\}$$

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

سوال

$$\begin{array}{r} x^3 - 2x^2 + 2x - 1 \quad | \quad x-1 \\ -x^3 + x^2 \\ \hline -x^2 + 2x - 1 \\ +x^2 - x \\ \hline x - 1 \\ -(x-1) \\ \hline 0 \end{array}$$

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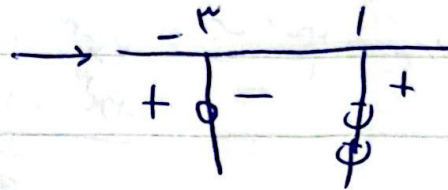
$$\rightarrow x-1(x^2 - x + 1) \rightarrow x^3 - 1 \rightarrow Df = R - \{1\}$$

$$\Delta < 0 \rightarrow b^2 - 4ac < 0 \rightarrow 1 - 4(1)(1) < 0$$

Scanned

$$b) y = \sqrt{\frac{x+3}{x^2-2x^2+2x-1}} = \sqrt{\frac{x+3}{(x-1)(x^2-x+1)}}$$

$$\begin{array}{r} x^2-2x^2+2x-1 \quad | \quad x-1 \\ -x^2+x^2 \quad \quad \quad x^2-x+1 \\ \hline -x^2+2x-1 \\ +x^2-x \\ \hline x-1 \end{array}$$



$$\rightarrow D_f = (-\infty, -3) \cup (1, +\infty)$$

$$y = \frac{x}{x^2-2|x-1|-2x+2}$$

← سرائی

$$\rightarrow \textcircled{1} x^2-2|x-1|-2x+2 \xrightarrow{x \geq 1} x^2-2x+2-2x+2 \rightarrow x^2-4x+4$$

$$\rightarrow (x-2)(x-2) \neq 0 \Rightarrow \begin{cases} x \neq 2 \\ x \neq 0 \end{cases}$$

$$\textcircled{2} x^2-2|x-1|-2x+2 \xrightarrow{x \leq 1} x^2+2x-2-2x+2 = x^2$$

$$\rightarrow x(x+2) \neq 0 \Rightarrow \begin{cases} x \neq 0 \\ x \neq -2 \end{cases}$$

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

$$y = \frac{x+3}{|2x+1|-|x+3|} \rightarrow |2x+1|-|x+3| \neq 0$$

← سرائی

$$\rightarrow |2x+1| = |x+3| \rightarrow 2x+1 = \pm(x+3) \rightarrow 2x+1 = x+3$$

$$\rightarrow x=2 \rightarrow x \neq 2$$

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

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

$$y = \sqrt{|2x+1|-|x+3|} \rightarrow |2x+1|-|x+3| \geq 0 \rightarrow |2x+1| \geq |x+3|$$

$$\text{نوع ٢} \rightarrow (11x+1)^2 \geq (11x+3)^2 \rightarrow 121x^2 + 22x + 1 \geq 121x^2 + 66x + 9$$

$$3x^2 - 2x - 8 \geq 0 \rightarrow x^2 - 2x - 2\frac{8}{3} = (x^2 - 4)(x + \frac{4}{3}) \div 3 \rightarrow x = 2$$

$$\rightarrow \frac{-\frac{4}{3}}{+4} - \frac{2}{+4} \rightarrow (-\infty, -\frac{4}{3}] \cup [2, +\infty)$$

سوال ٥ ← $y = \log_2(1 - \log_2 x)$ $\rightarrow x > 0$

$$1 - \log_2 x > 0 \rightarrow \log_2 x \leq 1 \rightarrow x \leq 2$$

ب) $\log_2(1 - \log_2 \frac{x}{2})$ $\rightarrow 1 - \log_2 \frac{x}{2} > 0$

$$\rightarrow \log_2 \frac{x}{2} < 1 \rightarrow \frac{x}{2} < 2 \rightarrow x < 4$$

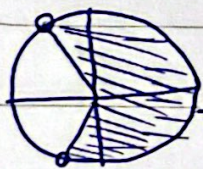
$$\rightarrow Df = (\frac{1}{2}, +\infty)$$

سوال ٦ ← $f(x) = \sqrt{\log_2 \log_2 (x-1)}$ $\rightarrow \log_2 (x-1) > 0 \rightarrow x-1 > 1 \rightarrow x > 2$

$$\rightarrow Df = (2, +\infty)$$

سوال ٧ ← $y = \log_2(2\cos x + 1)$ $\rightarrow 2\cos x + 1 > 0 \rightarrow \cos x > -\frac{1}{2}$

$$Df =$$



$$\rightarrow R = [2k\pi - \frac{\pi}{3}, 2k\pi + \frac{\pi}{3}]$$

ب) $y = \sqrt{\log_2 \frac{x-1}{x+1}}$ $\Rightarrow \frac{x-1}{x+1} > 0 \Rightarrow x > 1$

$$\rightarrow Df = (-\infty, -1)$$

$$f(x) = \sqrt{(a+2)x^2 + ax + b} \rightarrow$$

سوال ←

$$D_f = (-\infty, 3] \rightarrow \text{عین عبارت درجه یک است} \rightarrow a+2=0 \rightarrow a=-2$$

$$\rightarrow \sqrt{-2x+b} \rightarrow -2x+b \xrightarrow{x=3} -2(3)+b \geq 0 \rightarrow -4+b \rightarrow \boxed{b=4}$$

$$f(x) = \sqrt{x^2 + 2x + 2 - m^2} \rightarrow \text{عین عبارت درجه یک دارد و در آن که جبر از صفر است}$$

سوال ←

$$\rightarrow \Delta < 0 \rightarrow b^2 - 4ac < 0 \rightarrow (2)^2 - 4(1)(2-m^2) < 0 \rightarrow 4 - 8 + 4m^2 < 0$$

$$\rightarrow 4m^2 - 4 < 0 \rightarrow 4(m^2 - 1) < 0 \rightarrow 4(m-1)(m+1) < 0$$

$$\rightarrow \frac{-1}{+1} \rightarrow (1, 1)$$

کسر مثبت → -1
بیشتر از صفر → +1

$$\rightarrow +1 \text{ یا } -1 = \boxed{+2}$$

$$f(x) = \frac{\sqrt{4-x^2}}{[x] + [-x] + 1}$$

سوال ←

$$\rightarrow [x] + [-x] + 1 \neq 0 \rightarrow [x] + [-x] \neq -1$$

→ اگر عدد صحیح باشد تقریباً نشود پس

$$\textcircled{1} x \in \mathbb{Z}$$

$$\textcircled{2} 4 - x^2 \geq 0 \rightarrow (2-x)(2+x) \geq 0 \rightarrow \frac{-2}{-1} \rightarrow \boxed{5}$$

$$\rightarrow [-2, 2]$$

$$\xrightarrow{192} \{-2, -1, 0, 1, 2\} = D_f \quad \boxed{\text{اعداد صحیح}}$$