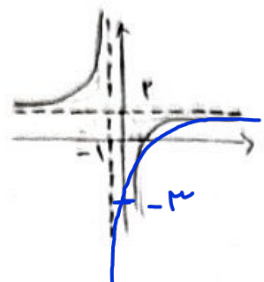
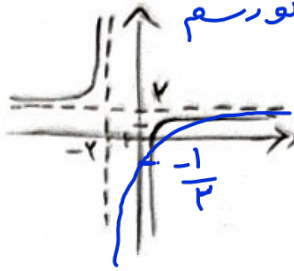
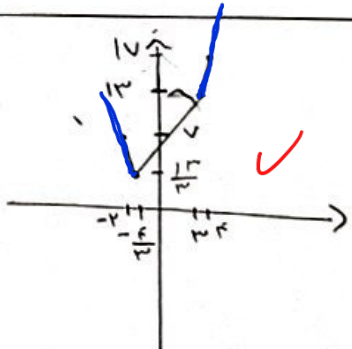
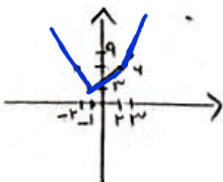
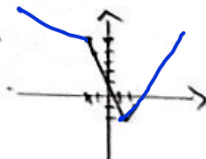


19, 25

نام و نام خانوادگی شماره کلاس پاسخنامه تشریحی تکلیف شماره 4

الف) $y = x^3 - 3x^2 + 3x - 1$ $\rightarrow y - 1 = x^3 - 3x^2 + 3x - 1$ $\rightarrow y - 1 = (x - 1)^3 \rightarrow \sqrt[3]{y - 1} + 1 = x$ $y \in \mathbb{R} \checkmark$	ب) $y = \frac{1}{x^2 - 2x}$ $y x^2 - 2y x = 1 \rightarrow y x^2 - 2y x - 1 = 0$ $x = \frac{2y \pm \sqrt{4y^2 + 4y}}{y} \rightarrow 4y^2 + 4y \geq 0$ $y(y + 1) \geq 0 \rightarrow y \in (-\infty, -1] \cup [0, +\infty)$	1, 1.75
الف) $a > 0 \rightarrow \min x_{\min} = -\frac{b}{2a} = 2 \mid y_{\min} = 4 \Rightarrow y \in [4, +\infty) \checkmark$ ب) $a < 0 \rightarrow \max x_{\max} = -\frac{b}{2a} = 3 \rightarrow y_{\max} = 12 \Rightarrow y \in (-\infty, 12] \checkmark$ ج) $a > 0 \rightarrow \min x_{\min} = -\frac{b}{2a} = 2 \rightarrow y_{\min} = -4 \Rightarrow y \in \sqrt{[-4, +\infty)} = [0, +\infty) \checkmark$ د) $a < 0 \rightarrow \max x_{\max} = -\frac{b}{2a} = 3 \rightarrow y_{\max} = 9 \Rightarrow y \in \sqrt{(-\infty, 9]} = [0, 3] \checkmark$		2
الف) $y = x^3 - 5x^2 + 2x + 1 \rightarrow y \in \mathbb{R} \checkmark$ ب) $y = x^3 - 4x^2 + 3x + 2 \rightarrow y \in \mathbb{R} \checkmark$ ج) $y = \sqrt{x^3 - 4x^2 + 5x + 1} \rightarrow y \in \sqrt{\mathbb{R}} = [0, +\infty) \checkmark$ د) $y = (x^3 - 4x^2 + 3x + 1)^2 \Rightarrow y \in (\mathbb{R})^2 = [0, +\infty) \checkmark$		3
الف) $y = \frac{3x+1}{x-2} \rightarrow y \in \mathbb{R} - \{\frac{3}{2}\} = \mathbb{R} - \{3\} \checkmark$ ب) $y = \frac{2x+1}{x+1} \rightarrow y \in \mathbb{R} - \{\frac{2}{1}\} = \mathbb{R} - \{2\} \checkmark$		4
الف) $y = \sqrt{\frac{3x+1}{x+1}} \rightarrow y \in \sqrt{\mathbb{R} - \{\frac{3}{2}\}} = [0, +\infty) - \{\sqrt{2}\} \checkmark$ ب) $y = \sqrt{\frac{3x+1}{2-x}} \rightarrow y \in \sqrt{\mathbb{R} - \{\frac{3}{2}\}} = [0, +\infty) \checkmark$		5

الف) $x = \frac{1}{y}$ $\Rightarrow y = \frac{1}{x}$ $y = \frac{2x-3}{x+1}$ $x=1 \rightarrow y = -\frac{1}{2}$ 	ب) $x = \frac{1}{y}$ $\Rightarrow y = \frac{1}{x}$ $y = \frac{2x-1}{x+2}$ $x=1 \rightarrow y = \frac{1}{3}$ 	١, ٥	٦
الف) $y = \sin x + \frac{1}{\sin x} \rightarrow y \in (-\infty, -2] \cup [2, +\infty)$ ✓ ب) $y = \frac{x^4+1}{x^2} = x^2 + \frac{1}{x^2} \rightarrow y \in (-\infty, -2] \cup [2, +\infty)$ ✓ ج) $y = \frac{\sqrt{x^2+1}}{\sqrt{x}} = \sqrt{x} + \frac{1}{\sqrt{x}} \rightarrow y \in (-\infty, -2] \cup [2, +\infty)$ ✓ د) $y = \sqrt{x} + \frac{1}{\sqrt{x}} \rightarrow y \in [2, +\infty)$ ✓		٢	٧
الف) $y = x^2 + \frac{1}{x^2+2} \rightarrow y+2 = x^2+2 + \frac{1}{x^2+2}$ $x^2+2 = u$ $\rightarrow u + \frac{1}{u} = \frac{10}{u} \rightarrow y+2 \in [\frac{10}{u}, +\infty)$ $\rightarrow y \in [\frac{1}{u}, +\infty)$ ✓	ب) $y = \frac{x^2+2+1}{\sqrt{x^2+2}} = \sqrt{x^2+2} + \frac{1}{\sqrt{x^2+2}}$ $\sqrt{x^2+2} = u \rightarrow u + \frac{1}{u} = \frac{5}{u}$ $\rightarrow y \in [\frac{5}{u}, +\infty)$ ✓	٢	٨
$x-2=0 \rightarrow x=2$ $\{ 2x+2=0 \rightarrow x=-2$ $\frac{-2}{-2x-1} \quad \frac{2}{2x+1}$ $x=2 \rightarrow y=14$ $x=-2 \rightarrow y=2$		٢	٩
الف) $x-2=0 \rightarrow x=2$ $\{ 2x+2=0 \rightarrow x=-1$ $\frac{-1}{-2x-1} \quad \frac{2}{2x+1}$ $R_f \in [2, +\infty)$ ✓ $x=2 \rightarrow y=9$ $\{ x=-2 \rightarrow y=4$ 	ب) $2x-2=0 \rightarrow x=1$ $\{ x+1=0 \rightarrow x=-1$ $\frac{-1}{2x-1} \quad \frac{1}{x+1}$ $x=2 \rightarrow y=-1$ $R_f \in [-2, +\infty)$ ✓ $x=-2 \rightarrow y=2$ 	٢	١٠