۲۰

نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۶ ..... کلاس یازدهم .....

۱

الف) $y = x^3 - 3x^2 + 3x - 1 + 1 = (x-1)^3 + 1 \rightarrow y - 1 = (x-1)^3 \rightarrow \sqrt[3]{y-1} + 1 = x$

$\hookrightarrow y = \mathbb{R}$

ب) $y = \frac{1}{x^2 - 2x} \rightarrow yx^2 - 2yx - 1 = 0 \rightarrow \Delta \geq 0 \rightarrow 4y^2 + 4 \geq 0$

	-1		0	
	$+$	$-$	$+$	

$y = (-\infty, -1] \cup [0, +\infty)$

۲

الف) $x^2 - 4x + 10 \rightarrow min = \frac{-b}{2a} = 2 \rightarrow if\ x = 2 \rightarrow y = 6 \rightarrow y = [6, +\infty)$

ب) $y = -x^2 + 4x + 3 \rightarrow max = \frac{-b}{2a} = 2 \rightarrow if\ x = 2 \rightarrow y = 12 \rightarrow y = (-\infty, 12]$

ج) $y = \sqrt{x^2 - 4x - 3} \rightarrow min = \frac{-b}{2a} = 2 \rightarrow if\ x = 2 \rightarrow y = -7 \rightarrow y = [0, +\infty)$

د) $y = \sqrt{4x - x^2} \rightarrow max = \frac{-b}{2a} = 2 \rightarrow if\ x = 2 \rightarrow y = 4 \rightarrow y = [0, 2]$

۳

الف) $y = x^3 - 5x^2 + 2x + 1 \rightarrow y = \mathbb{R}$

ب) $y = x^5 - 4x^4 + 2x + 2 \rightarrow y = \mathbb{R}$

ج) $y = \sqrt{x^6 - 4x^4 + 5x + 1} = \sqrt{\mathbb{R}} = y = [0, +\infty)$

د) $y = (x^5 - 4x^2 + 2x + 1)^2 = (\mathbb{R})^2 = y = [0, +\infty)$

۴

الف) $y = \frac{3x + 1}{x - 2} \rightarrow y = \mathbb{R} - \{\frac{a}{c}\} = y = \mathbb{R} - \{3\}$

ب) $y = \frac{2x + 1}{x + 1} \rightarrow y = \mathbb{R} - \{2\}$

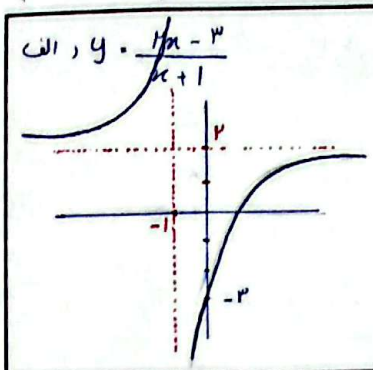
۵

الف) $y = \sqrt{\frac{2x + 4}{x + 1}} \rightarrow y = \sqrt{\mathbb{R} - \{2\}} \rightarrow y = [0, +\infty) - \{\sqrt{2}\}$

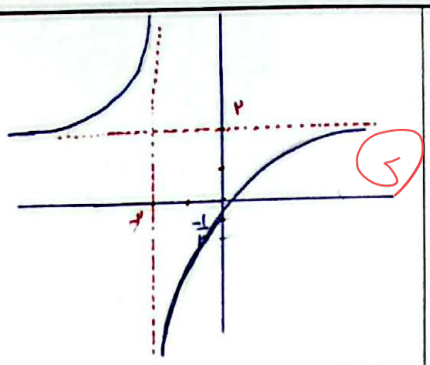
ب) $y = \sqrt{\frac{2x + 1}{2 - x}} \rightarrow y = \sqrt{\mathbb{R} - \{-2\}} \rightarrow y = [0, +\infty)$

۶

الف، $y = \frac{۲x-۳}{x+۱}$



ب، $\frac{۲x-۱}{x+۲}$



ک

۷

الف، $y = \sin x + \frac{۱}{\sin x}$ → $y = (-\infty, -۲] \cup [۲, +\infty)$

ب، $y = \frac{x^۴+۱}{x^۲} = x^۲ + \frac{۱}{x^۲}$ → $y = (-\infty, -۲] \cup [۲, +\infty)$

ج، $y = \frac{\sqrt[۳]{x^۲+۱}}{\sqrt[۳]{x}} = \sqrt[۳]{x} + \frac{۱}{\sqrt[۳]{x}}$ → $y = (-\infty, -۲] \cup [۲, +\infty)$

د، $y = \sqrt{x} + \frac{۱}{\sqrt{x}}$ → $y = [۲, +\infty)$

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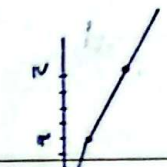
۸

الف، $y = \underbrace{x^۲ + \frac{۱}{x^۲+۳}}_{[\frac{۱۰}{۳}, +\infty)} + ۳ - ۳ = [\frac{۱۰}{۳}, +\infty) - ۳ = [\frac{۱}{۳}, +\infty) = y$

if $x = ۰ \rightarrow ۳ + \frac{۱}{۳} = \frac{۱۰}{۳}$

ب $\frac{x^۲+۴+۱}{\sqrt{x^۲+۴}} = \sqrt{x^۲+۴} + \frac{۱}{\sqrt{x^۲+۴}}$ $۲ + \frac{۱}{۲} = \frac{۵}{۲}$ → $y = [\frac{۵}{۲}, +\infty)$



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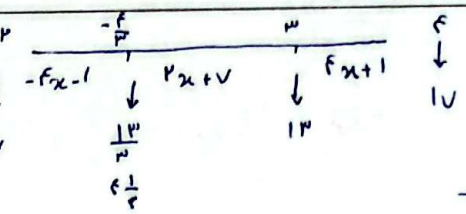
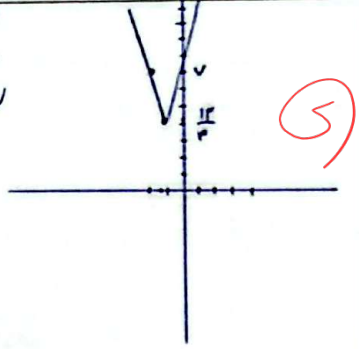
$y = |x-۳| + |۳x+۶|$





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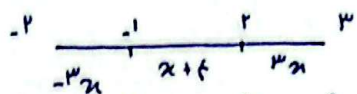
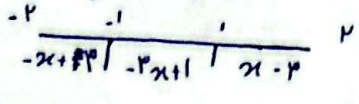
۱۰

الف، $y = |x-۲| + |۲x+۲|$



$y = [۳, +\infty)$

ب، $y = |۳x-۲| - |x+۱|$



$y = [-۲, +\infty)$

بهتر است نمودارهم رسم شود