

نام و نام خانوادگی امیر حسین پاسخنامه تشریحی تکلیف شماره ۲ کلاس نازدلم ۱

$$x^3 - 3x^2 + 2x \sim (x-1)^2 + 1 = y \quad x = \sqrt[3]{y-1} + 1 \quad R_f = \mathbb{R} \quad \checkmark$$

$$\frac{1}{x^2 - 2x} = y \sim \frac{1}{(x-1)^2 - 1} = y \sim \frac{1}{y} = (x-1)^2 - 1$$

$$x = \pm \sqrt{\frac{1}{y} + 1} + 1 \quad y \neq [-1, 0] \quad R_f = \mathbb{R} - (-1, 0] \quad \checkmark$$

$$x^2 - 4x + 1 \quad \frac{-b}{2a} = 2 \quad y_{\min} = -3 \quad R_f = [4, +\infty) \quad \checkmark$$

$$-x^2 + 4x + 3 \quad \frac{-b}{2a} = 2 \quad y_{\max} = 11 \quad R_f = (-\infty, 11] \quad \checkmark$$

$$\sqrt{x^2 - 4x - 2} \quad \frac{-b}{2a} = 2 \quad y_{\min} = -7 \quad R_f = \sqrt{[-7, +\infty)} \sim R_f = [0, +\infty) \quad \checkmark$$

$$\sqrt{4x - x^2} \quad \frac{-b}{2a} = 2 \quad y_{\max} = 9 \quad R_f = \sqrt{(-\infty, 9]} \sim R_f = [0, 3] \quad \checkmark$$

$$x^3 - 5x^2 + 2x + 1 \quad \text{بزرگترین توان فرد} \rightarrow R_f = \mathbb{R} \quad \checkmark$$

$$x^3 - 4x^2 + 2x + 2 \quad \text{بزرگترین توان فرد} \rightarrow R_f = \mathbb{R} \quad \checkmark$$

$$\sqrt{x^3 - 4x^2 + 5x + 1} \quad \text{بزرگترین توان فرد} \rightarrow \sqrt{y} \sim [0, +\infty) \quad \checkmark$$

$$(x^3 - 4x^2 + 2x + 1)^2 \quad \text{بزرگترین توان فرد} \rightarrow y^2 \sim [0, +\infty) \quad \checkmark$$

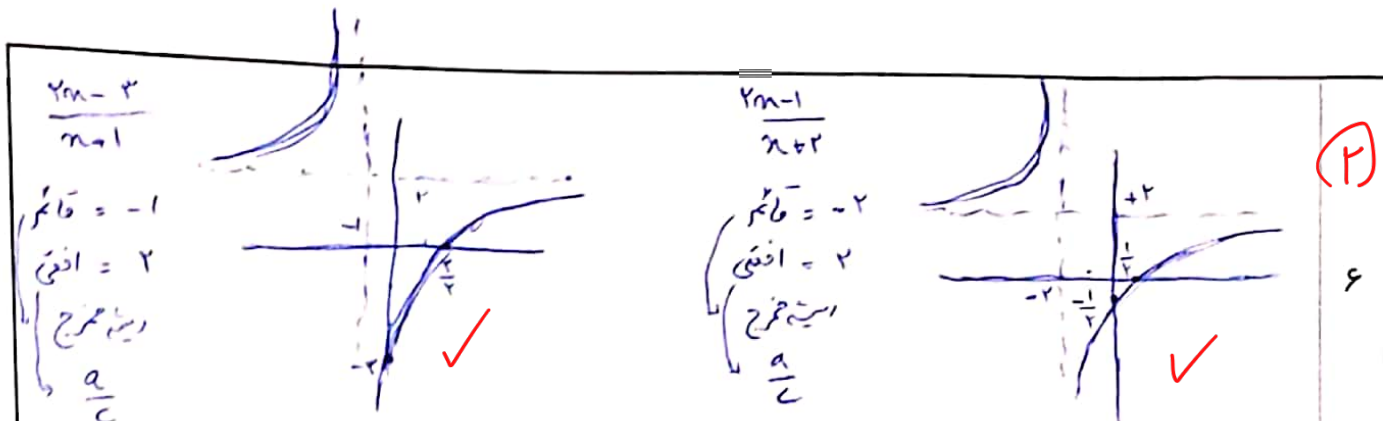
$$\frac{3x+1}{x-2} \sim \mathbb{R} - \left\{\frac{a}{c}\right\} \Rightarrow R_f = \mathbb{R} - \{2\} \quad \checkmark$$

$$\frac{2x+1}{x+1} \sim \mathbb{R} - \left\{\frac{a}{c}\right\} \Rightarrow R_f = \mathbb{R} - \{2\} \quad \checkmark$$

$$\sqrt{\frac{2x+2}{x+1}} \sim \sqrt{\mathbb{R} - \left\{\frac{a}{c}\right\}} \Rightarrow R_f = [0, +\infty) - \{\sqrt{2}\} \quad \checkmark$$

$$\sqrt{\frac{2x+1}{x-2}} \sim \sqrt{\mathbb{R} - \left\{\frac{a}{c}\right\}} \Rightarrow R_f = [0, +\infty) \quad \checkmark$$

$\mathbb{R}^+ - \sqrt{-2} \sim \sqrt{-2} \cup \emptyset$



$\sin x + \frac{1}{\sin x} \quad a > 0 \quad a < 0 \quad \leadsto \quad Rf = (-\infty, -2] \cup [2, +\infty)$ ✓

$\frac{x^2+1}{x^2} = x^2 + \frac{1}{x^2} \quad a > 0 \quad a < 0 \quad \leadsto \quad Rf = (-\infty, -2] \cup [2, +\infty)$ ✓

$\frac{\sqrt{x^2+1}}{\sqrt{x}} = \sqrt{x} + \frac{1}{\sqrt{x}} \quad a > 0 \quad a < 0 \quad \leadsto \quad Rf = (-\infty, -2] \cup [2, +\infty)$ ✓

$\sqrt{x} + \frac{1}{\sqrt{x}} \quad a > 0 \quad \leadsto \quad Rf = [2, +\infty)$ ✓

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$x^2 + \frac{1}{x^2+3} \quad \leadsto \quad \text{کثیرالحدی} \quad \leadsto \quad 0 + \frac{1}{0+3} = \frac{1}{3} \quad \leadsto \quad Rf = [\frac{1}{3}, +\infty)$ ✓

$\frac{x^2+4}{\sqrt{x^2+4}} = \frac{x^2+4}{\sqrt{x^2+4}} = \sqrt{x^2+4} + \frac{1}{\sqrt{x^2+4}} \quad \leadsto \quad \text{کثیرالحدی} \quad \leadsto \quad 0+4 + \frac{1}{\sqrt{0+4}} = 5$

$y + \frac{1}{y} \quad \leadsto \quad Rf = [\frac{4}{y}, +\infty)$ ✓

$|x-3| + |y+2|$

$x \geq 3 \quad ; \quad y \geq -2$
 $-\frac{5}{3} \leq x < 3 \quad ; \quad y = -2$
 $x < -\frac{5}{3} \quad ; \quad -4 \leq y < -2$

$Rf = [\frac{13}{4}, +\infty)$

$|x-2| + |y+2|$

$x \geq 2 \quad ; \quad y \geq -2$
 $-1 \leq x < 2 \quad ; \quad y = -2$
 $x < -1 \quad ; \quad -2 \leq y < -2$

$Rf = [2, +\infty)$ ✓

$|ym-2| - |x+1|$

$x \geq 1 \quad ; \quad y = 3$
 $-1 \leq x < 1 \quad ; \quad -3 \leq y < 3$
 $x < -1 \quad ; \quad -y = 3$

$Rf = [-2, +\infty)$ ✓