عارف سعادت نیا — دهم دوم A

۱)

الف) $x^2 = y + 5$ $\quad x = \pm\sqrt{y+5}$ $\quad R_f = [-5, +\infty)$

ب) $x^3 = y - 1$ $\quad x = \sqrt[3]{y-1}$ $\quad R_f = \mathbb{R}$

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۲) الف) $y = x^2 - 4x + 6$ $\quad y = (x-2)^2 + 2 \rightarrow y - 2 = (x-2)^2 \rightarrow \pm\sqrt{y-2} + 2$ $\quad R_f = [2, \infty)$

ب) $y = x^2 - 5x + 1$ $\quad y = (x - \frac{5}{2})^2 - \frac{21}{4} \rightarrow \pm\sqrt{y + \frac{21}{4}} + \frac{5}{2} = x \rightarrow R_f = [-\frac{21}{4}, +\infty)$

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۳) الف) $x^2 + 3 = yx^2 - 2y$ $\quad x^2 - yx^2 = -2y - 3$ $\quad x^2(1-y) = -2y - 3$

$x^2 = \frac{-2y-3}{1-y}$ $\quad x^2 = \frac{(2y+3)}{(y-1)}$ $\quad x = \pm\sqrt{\frac{2y+3}{y-1}}$ $\quad -\frac{3}{2}, 1$: $+ \mid - \mid +$ $\quad R_f = (-\infty, -\frac{3}{2}] \cup (1, +\infty)$

ب) $2|x| + 1 = y|x| - 4y$ $\quad 2|x| - y|x| = -4y - 1$ $\quad |x|(2-y) = -4y - 1$

$|x| = \frac{-4y-1}{2-y} = \frac{4y+1}{y-2}$ $\quad x = \pm\frac{4y+1}{y-2}$ $\quad -\frac{1}{4}, 2$: $+ \mid - \mid +$ $\quad R_f = (-\infty, -\frac{1}{4}] \cup [2, +\infty)$

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۴) الف) $y = \frac{1}{x^2 + 4x}$ $\quad yx^2 + 4yx - 1 = 0$ $\quad \Delta = 16y^2 + 4y \geq 0$

$4y(4y+1) \geq 0$

$4y = 0$, $y = 0$ $\quad 4y + 1 = 0$, $4y = -1$, $y = -\frac{1}{4}$

$-\frac{1}{4}, 0$: $+ \mid - \mid +$

$R_f = (-\infty, -\frac{1}{4}] \cup [0, +\infty)$

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۵) الف) $a > 0$ $\quad x_{min} = \frac{6}{2} = 3$ $\quad R_f = [-7, +\infty)$

$y_{min} = 9 - 18 + 2 = -7$

ب) $a < 0$ $\quad x_{max} = \frac{4}{2} = 2$ $\quad R_f = (-\infty, 6]$

$y_{max} = -4 + 8 + 2 = 6$

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۶) الف) $a > 0$ $\quad x_{min} = \frac{6}{2} = 3$

$y_{min} = 9 - 18 + 2 = -7 \rightarrow [-7, +\infty) \xrightarrow{\sqrt{\ }} R_f = [0, +\infty)$

ب) $a < 0$ $\quad x_{max} = \frac{-6}{-2} = 3$

$y_{max} = -9 + 18 + 5 = 14 \rightarrow (-\infty, 14] \xrightarrow{\sqrt{\ }} R_f = [0, 14]$

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۷) الف) $R_f = \mathbb{R}$ $\qquad$ ب) $R_f = [0, +\infty)$

۸) الف) $ad - bc = ۶ \neq ۱$ $\frac{a}{c} = ۳$ $R_f = \mathbb{R} - \{\frac{a}{c}\}$ $R_f = \mathbb{R} - \{۳\}$

ب) $۱۲ \neq ۱$ $\frac{a}{c} = ۴$ $\mathbb{R} - \{۴\}$ $[۰, +\infty) - \{۲\}$ $R_f = [۰, +\infty) - \{۲\}$

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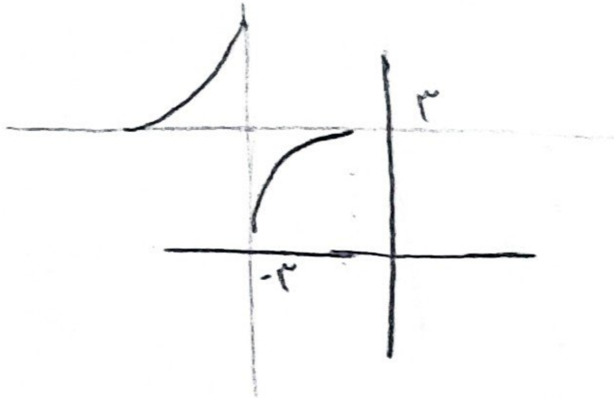
۹) الف)

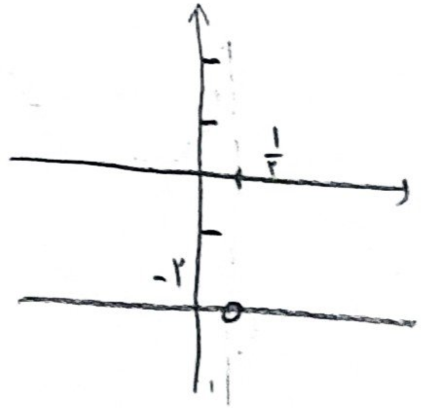
$x + ۳ = ۰$

$x = -۳$

$y = \frac{a}{c} = ۳$



ب) $y = \frac{۴x - ۲}{-۲x + ۱}$



$۴x - ۲ = -۲xy + y$

$۴x + ۲xy = y + ۲$

$x(۴ + ۲y) = y + ۲$

$x = \frac{y + ۲}{۲(y + ۲)} = \frac{۱}{۲}$

$y \neq -۲$

$R_f = \{-۲\}$

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۱۰) الف) $a + \frac{۱}{a}$ $a > ۰$ $R_f = [۲, +\infty)$

ب) $\sqrt[۳]{\frac{x^۲}{x} + \frac{۱}{x}} = \sqrt[۳]{x + \frac{۱}{x}}$ $R_f = (-\infty, -۲] \cup [۲, +\infty)$