

(بنام خدا)

۱۸

حساب خالص / تلف ۵ / (طرح هم دفتر B)

الف) $y = \frac{|x|+1}{|x|-2} \rightarrow y = \frac{\square+1}{\square-2} \rightarrow \frac{1}{\square-2} = y - \frac{1}{\square+1}$

(۲)
1

ب) $y = \frac{x^2+1}{|x|} \rightarrow y = \frac{(x^2)^2+1}{x^2} \rightarrow y = |x| + \frac{1}{|x|}$

$(-\infty, -\frac{1}{2}] \cup (1, +\infty)$

$R_f = (-\infty, -\frac{1}{2}] \cup (1, +\infty)$

$y = \frac{x^2+2x-2}{x+3} \rightarrow x^2+2xy = x^2+3x-2$

$R_f = ?$

$\Delta = (y+2)(y+3)$

$\Delta = (y+2)^2 - 4(-2-y) \Rightarrow y^2 - 4y + 4 + 8 + 4y = y^2 + 12$

$R_f = [0, 1]$

(۲)
2

الف) $f(x) = \frac{x^2-x+1}{x^2-x+1} \rightarrow \frac{\square+\frac{1}{\square}}{\square+1} \rightarrow \frac{1}{\square+1} = y - \frac{1}{\square}$

$R_f = D_f = ?$

$x^2-x-1 \rightarrow x(x-1)$

$x \in \mathbb{R} \rightarrow x \in (-\infty, +\infty)$

$x \in (-\infty, +\infty) \rightarrow x \in (-\infty, +\infty)$

$R_f = D_f = \mathbb{R}$

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الف) $y = \sqrt{-x^2+8x+1}$

$C = \frac{b^2}{4a} \rightarrow -1 - \frac{16}{4} \rightarrow 3 \rightarrow (-\infty, 3]$

ب) $y = \sqrt[3]{2x^2-18x}$

$2x(x-9)$

$x \in \mathbb{R} \rightarrow x \in (-\infty, +\infty)$

$x \in (-\infty, +\infty) \rightarrow x \in (-\infty, +\infty)$

$R_f = D_f = \mathbb{R}$

(۲)
4

الف) $y = \log(x^3-x+1)$

x^3-x+1

$x \in \mathbb{R} \rightarrow x \in (-\infty, +\infty)$

$x \in (-\infty, +\infty) \rightarrow x \in (-\infty, +\infty)$

$R_f = D_f = \mathbb{R}$

(۲)
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(2)

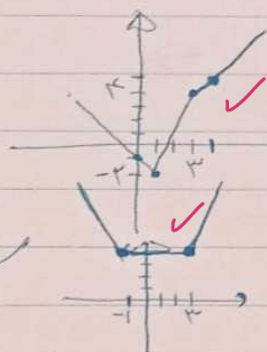
$$y = |2x-2| - |x-3|$$

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$$\frac{2-2x+2x-2}{-2x-1} \quad \frac{2x-2+3-2}{2x-5} \quad \frac{2x-2-x+3}{x+1} \rightarrow 2x-2$$

$$y = |x-3| + |x+1| \rightarrow \text{النقطة}$$

$$\frac{x-1+3-x}{-2x+2} \quad \frac{2x-3+1}{2x-2} \quad \frac{2x-3+1}{2x-2} \rightarrow 2x-2$$



$$[-1, +\infty)$$

$$[1, +\infty)$$

7

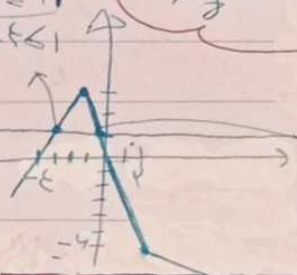
$$|x-2| - |2x+2| \leq 1$$

$$x \leq -1 \quad x+5 \leq 1$$

$$R_f = \mathbb{R} - (-3, \frac{1}{4})$$

(2)

$$\frac{2-x+2x+2}{x+4} \quad \frac{2x-2-2x-2}{-2x} \quad \frac{2x-2-2x-2}{-2x}$$



$$-3x \leq 1 \quad |2x-2| \leq \frac{1}{2}$$

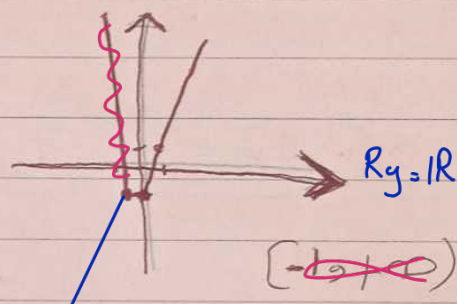
8

$$y = 3x - |2x+1| + |2x|$$

$$R_f = ?$$

$$\frac{3x+2x+1-x}{x+1} \quad \frac{3x-2x-1-x}{-1} \quad \frac{3x-2x-1-x}{-1}$$

تنبهوا بشه!



(1, 2)

$$R_y = \mathbb{R}$$

$$[-1, 1]$$

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$$y = [x] + [3-x]$$

$$[x] + [-x] + 3$$

$$x \in \mathbb{Z} \rightarrow y = 3$$

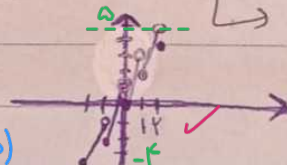
$$x \notin \mathbb{Z} \rightarrow y = 2$$

$$x \in [2, 3]$$

(1)

$$y = 3x - [x]$$

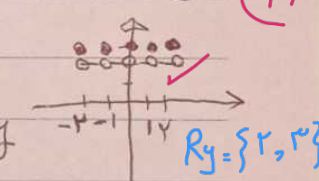
$$R_y = [-1, 2]$$



$$-2 \leq x < -1 \rightarrow 3x+2 \leq y < 3x+3 \quad x=2 \rightarrow y=2$$

$$-1 \leq x < 0 \rightarrow 3x+1 \leq y < 3x+2$$

$$0 \leq x < 1 \rightarrow 3x \leq y < 3x+1$$



$$R_y = \{2, 3\}$$

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$$y = \sin^2 x - \sin x + 1$$

$$-1 \leq \sin x \leq 1 \rightarrow \sin x \geq 1 \rightarrow y \geq 1$$

$$\sin x = \frac{b}{a} \rightarrow \frac{1}{2} \rightarrow \frac{1}{2} - \frac{1}{2} + 1 = 1$$

(2)

$$y = \sin^2 x + \sin^2 x + 1$$

$$R_f = [\frac{3}{2}, 3]$$

Elegance

$$\sin^2 x = \frac{b}{a} = \frac{1}{2}$$

$$\sin^2 x \geq 1 \rightarrow y \geq 3$$

$$\sin^2 x \geq 0 \rightarrow y \geq 1$$

$$[1, 3]$$