

نام و نام خانوادگی: حسنا رحمانی
استخدامه شخصی تکلیف شماره 1 کلاس یازدهم
درجۀ سنی

$$A = \{1, 2, 3\}$$

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

$$A \times B - B^2 \rightarrow \{(1, 2), (1, 3), (2, 2), (2, 3), (3, 2), (3, 3)\} - \{(2, 2), (2, 3), (3, 2), (3, 3)\} = \{(1, 2), (1, 3)\}$$

$$الف) f(x) = \{(3, m^2), (2, 1), (-3, m), (2, m), (3, m+2), (m, 4)\}$$

$$\frac{m^2 - 2m + 2}{m^2 - m - 2 = 0}$$

$$(m-2)(m+1) \rightarrow m=2 \rightarrow (2, 4) \text{ و } (2, 1)$$

$$\rightarrow m=1$$

$$m=2 \text{ و } m=1$$

$$ب) g(x) = \{(3, m^2), (2, 1), (m, 4), (3, m+2), (-2, m), (-1, 3)\}$$

$$m^2 - 2m + 2 \rightarrow m^2 - m - 2 = 0 \rightarrow (m-2)(m+1) \rightarrow m=2 \rightarrow (2, 1) \text{ و } (2, 4) \text{ و } (-1, 3) \text{ و } (-2, m)$$

$$f(x) = \begin{cases} x^2 - 1; & x \leq 1 \\ ax + b; & 1 \leq x \leq 2 \\ x^3; & x \geq 2 \end{cases}$$

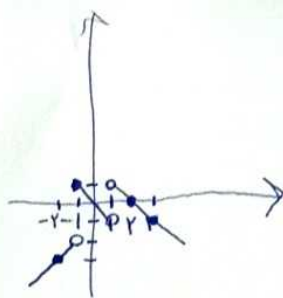
$$ax + b = -4$$

$$f(x) = \begin{cases} 2x - 3; & x \geq k \\ 4 - 3x; & x \leq k \end{cases}$$

$$\frac{2k - 3 = 4 - 3k}{\Delta k = 7 \rightarrow k = \frac{7}{5} = 1,4}$$

$$k \rightarrow 1,4$$

$$f(x) = \begin{cases} -2x^2 & ; x > 1 \\ -x & ; -1 \leq x < 1 \\ x-1 & ; x < -1 \end{cases}$$



$$D_f = \mathbb{R} - \{1\}$$

$$R_f = (-\infty, 1]$$

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الف) $2y^3 + x^2 + 1 = 0$
 $(x_1, y_1) \in f \rightarrow 2y_1^3 + x_1^2 + 1 = 0$
 $(x_2, y_2) \in f \rightarrow 2y_2^3 + x_2^2 + 1 = 0$

تابع: $\checkmark$ X
 $2y_1^3 - 2y_2^3 = 0$
 $\checkmark y_1, y_2 \neq 0 \rightarrow (y_1^3 - y_2^3) = 0$
 $(y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2) = 0$

ب) $x^2 + 4y^2 - 2x - 12y + 6 = 0$

$x^2 - 2x + 1 + 4y^2 - 12y + 9 = 0$
 $(x-1)^2 + (2y-3)^2 = 0$
 $x=1, y=1.5$

تابع: $\checkmark$ X
 نقطه واحد است

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الف) $\sin x \leq y \leq \sin x$
 if $x \geq 0 \rightarrow y \in \mathbb{R}$
 تابع: $\checkmark$ X
 نیست

ب) $\left(\sqrt{\frac{x}{y}} + \sqrt{\left(\frac{x}{y}\right)^{-1}} = 2 \right)^2$

$\frac{x}{y} + \frac{y}{x} + 2\sqrt{\frac{xy}{xy}} = 4$

تابع: $\checkmark$ X
 $\frac{x}{y} + \frac{y}{x} = 2$
 $x=y$

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الف) $y = \sqrt{\frac{x-1}{x-3}} + \sqrt{\frac{2-x}{x-1}}$
 $\frac{1}{x-3} + \frac{1}{x-1} = 0$
 $\frac{x-1+x-3}{(x-3)(x-1)} = 0$
 $2x-4=0 \rightarrow x=2$

$D_f = [1, 3]$

$\sqrt{x} + \sqrt{y-1} = \sqrt{3}$

$\sqrt{y-1} = \sqrt{3} - \sqrt{x} \rightarrow x \leq 3$

$\sqrt{y-1} \geq 0 \rightarrow \sqrt{3} - \sqrt{x} \geq 0$

$D_f = [0, 3]$
 $\sqrt{3} \geq \sqrt{x}$
 $3 \geq x$

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الف) $y = \sqrt{x^2 - 4x + 4} \rightarrow (x-1)(x-3)$
 $x^2 - 4x + 4 = (x-2)^2$
 $\sqrt{(x-2)^2} = |x-2|$
 $D_f = (-\infty, 1] \cup (3, +\infty)$

ب) $y = \sqrt{x^2 - 4x + 4} \rightarrow (x-1)(x-3)$
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الف) $y = \sqrt{2x^2 - 8x + 6} \rightarrow 2x^2 - 8x + 6 = 0$
 $x^2 - 4x + 3 = 0$
 $(x-1)(x-3) = 0$
 $x=1, x=3$
 $D_f = (-\infty, 1] \cup [3, +\infty)$

ب) $y = \sqrt{2x^2 - 8x + 6} \rightarrow 2x^2 - 8x + 6 = 0$
 $x^2 - 4x + 3 = 0$
 $(x-1)(x-3) = 0$
 $x=1, x=3$
 $D_f = (-\infty, 1] \cup [3, +\infty)$

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