

پایه نامه شریعی تکلیف شماره ۷ نام و نام خانوادگی: راستین توکلی کلاسی: یازدهم سپهر

سوال ۱

$$x = (x-4) + 4 \Rightarrow x + 4\sqrt{x-4} = (x-4) + 4 + 4\sqrt{x-4} \Rightarrow (\sqrt{x-4} + 2)^2 \Rightarrow f(x) = \sqrt{x-4} + 2$$

$$\Rightarrow x - 4\sqrt{x-4} = (x-4) + 4 - 4\sqrt{x-4} = (\sqrt{x-4} - 2)^2 \Rightarrow g(x) = \sqrt{x-4} - 2$$

$$f(x) + g(x) = 2\sqrt{x-4} = a + b\sqrt{x+c} \Rightarrow \frac{a+b}{c} \Rightarrow \frac{2}{-4} = \boxed{\frac{1}{2}}$$

$$f(2) = \frac{2+2}{2-4+4} = -4 \quad f(1) = \frac{1+2}{1-4+4} = 3 \quad f(3) = \frac{5}{9-12+4} = 1 \quad f(5) = \frac{2}{3}$$

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سوال ۲

$$\frac{g}{f} \Rightarrow \left\{ \left(2, -\frac{1}{4}\right), (0, 4) \right\}$$

~~.....~~

$$f(2x) = \left\{ \left(\frac{1}{2}, 2\right), \left(\frac{3}{2}, -1\right), (2, 2), \left(-\frac{1}{2}, 4\right) \right\}$$

$$f(x^2) = \left\{ (1, 2), (-1, 2), (2, 2), (-2, 2), (\sqrt{3}, -1), (-\sqrt{3}, -1) \right\}$$

$$2g^2(x) + 1 = \left\{ (2, 9), (1, 3), (3, 9), (-1, 1) \right\}$$

$$\frac{2f}{g} = \left\{ (1, -4), (3, -1) \right\}$$

$$D_f \cap D_g = \{2, -2, 2\} \Rightarrow 2f = \left\{ (2, 2), (-2, 0), (2, 2) \right\} \Rightarrow h = 2f + g = \left\{ (2, 4), (-2, 2), (2, 4) \right\}$$

سوال ۳

$$\left(\frac{f}{g+1}\right)(x) = \frac{\sqrt{3x-x}}{x-2} \Rightarrow \frac{\sqrt{3x-x}}{(x-2)([x]-[x])+1} \Rightarrow (x-2) \neq 0 \quad x \neq 2$$

$$\left\{ \begin{array}{l} [x] - [-x] + 1 \neq 0 \\ \Downarrow \\ x \neq 2 \\ \Downarrow \\ x = -1 \end{array} \right\} = \text{.....}$$

سوال ۴

$$\left\{ \begin{array}{l} \sqrt{3x-x} > 0 \Rightarrow x > 0 \\ \sqrt{3x-x} > 0 \Rightarrow x > 0 \end{array} \right\} \Rightarrow D\left(\frac{f}{g+1}\right) = \{x \in \mathbb{Z} \mid x > 0, x \neq 2\}$$

$x(\sqrt{3}-1)$

$$f(1) = \sqrt{1-1-4} = 0$$

$$f(11) = \sqrt{11-11-4} = \sqrt{2}$$

$$f(4) = \sqrt{4-16-4} = 0$$

$$f(5) = \sqrt{25-25-4} = 2$$

$$h(x) = \frac{f(x)}{g(x)} = \left\{ (1, 0), (4, 0), \left(2, \frac{1}{\sqrt{2}}\right) \right\}$$

سوال ۵

$$y = x^2 - 2x + 1 \Rightarrow y = (x-1)^2 + 1 \Rightarrow (x-1)^2 = y-1 \Rightarrow (-\infty, +\infty) = (x-1)^2 + 1 \Rightarrow$$

$$= (-\infty, +\infty) = \mathbb{R}$$

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

$$t \geq 0 \Rightarrow t-1 \geq -1 \quad t-1 \neq 0 \Rightarrow t-1 \in [-1, 0) \cup (0, +\infty) \Rightarrow y \in (-\infty, -1] \cup (1, +\infty)$$

$$ا) y = x^2 - 5x + 10 \Rightarrow \text{محلای } \Rightarrow \frac{-b}{2a} \Rightarrow \frac{-(-5)}{2} = \frac{5}{2} = 2.5 \Rightarrow x = 2.5 \Rightarrow y = (2.5)^2 - 5(2.5) + 10 = 6.25 - 12.5 + 10 = 3.75 \Rightarrow$$

الف

$$y \in [3.75, +\infty)$$

$$ب) y = -x^2 + 6x + 12 \Rightarrow \text{محلای } \Rightarrow \frac{-b}{2a} \Rightarrow \frac{-6}{-2} = 3 \Rightarrow x = 3 \Rightarrow y = -(3)^2 + 6(3) + 12 = -9 + 18 + 12 = 21 \Rightarrow$$

$$y \in (-\infty, 21]$$

$$ج) y = \sqrt{x^2 - 4x - 12} \Rightarrow \text{محلای } \Rightarrow \frac{-b}{2a} = \frac{-(-4)}{2} = 2 \Rightarrow x = 2 \Rightarrow y = \sqrt{(2)^2 - 4(2) - 12} = \sqrt{4 - 8 - 12} = \sqrt{-16} \Rightarrow$$

$$\sqrt{x^2 - 4x - 12} \Rightarrow y \in [0, +\infty)$$

~~ب) $y = \sqrt{5x - x^2} \Rightarrow \text{محلای } \Rightarrow \frac{-b}{2a} = \frac{-5}{-2} = 2.5 \Rightarrow x = 2.5 \Rightarrow y = \sqrt{5(2.5) - (2.5)^2} = \sqrt{12.5 - 6.25} = \sqrt{6.25} = 2.5 \Rightarrow$~~

$$د) y = \sqrt{5x - x^2} \Rightarrow \text{محلای } \Rightarrow \frac{-b}{2a} = \frac{-5}{-2} = 2.5 \Rightarrow x = 2.5 \Rightarrow y = \sqrt{5(2.5) - (2.5)^2} = \sqrt{12.5 - 6.25} = \sqrt{6.25} = 2.5 \Rightarrow \sqrt{5x - x^2} \Rightarrow$$

$$y \in [0, 2.5]$$

$$الف) y = x^2 - 6x + 10 \Rightarrow \text{محلای } \Rightarrow \frac{-b}{2a} = \frac{-(-6)}{2} = 3 \Rightarrow x = 3 \Rightarrow y = (3)^2 - 6(3) + 10 = 9 - 18 + 10 = 1 \Rightarrow$$

$$ب) y = x^2 - 6x + 10 \Rightarrow \text{محلای } \Rightarrow \frac{-b}{2a} = \frac{-(-6)}{2} = 3 \Rightarrow x = 3 \Rightarrow y = (3)^2 - 6(3) + 10 = 9 - 18 + 10 = 1 \Rightarrow$$

ب) سوال

$$ج) y = \sqrt{x^2 - 6x + 10} \Rightarrow \sqrt{11} \Rightarrow y \in [0, +\infty)$$

$$د) y = (x^2 - 6x + 10)^2 \Rightarrow \sqrt{11} \Rightarrow y \in [0, +\infty)$$

$$y = \frac{2x+1}{x-2} \Rightarrow x = -\frac{2y-1}{y-2} \Rightarrow \frac{2y+1}{y-2} \Rightarrow y \neq 2 \Rightarrow y \in \mathbb{R} - \{2\}$$

الف سوال

$$y = \frac{2x+1}{x+1} \Rightarrow x = -\frac{y-1}{y-2} \Rightarrow \frac{y+1}{y-2} \Rightarrow y \neq 2 \Rightarrow y \in \mathbb{R} - \{2\}$$