

نام و نام خانوادگی ..... آیتین شیرازی فر ..... پاسخنامه تشریحی تکلیف شماره ۷۰۰ کلاس ..... بازرسی و تصدیق

۲. آزمون عمومی نیست

$$\left. \begin{aligned} f(x) &= \sqrt{x+2} \sqrt{x-2} = \sqrt{(\sqrt{x-2}+2)^2} \\ g(x) &= \sqrt{x-2} \sqrt{x+2} = \sqrt{(\sqrt{x+2}-2)^2} \end{aligned} \right\} x \geq 1 \rightarrow f(x) + g(x) = \sqrt{x-2} + 2 + \sqrt{x-2} - 2 = 2\sqrt{x-2}$$

$$f(x) + g(x) = a + b\sqrt{x+c}$$

$\downarrow$       $\downarrow$       $\downarrow$   
 $a$       $b$       $c$

$$\frac{a+b}{c} = \frac{2}{-2} = -1 \quad \text{ج}$$

$$\frac{g}{f} = \left\{ \left(2, -\frac{1}{2}\right), \left(1, \frac{9}{2}\right), \left(3, \frac{5}{2}\right), \left(0, \frac{11}{2}\right) \right\}$$

$\downarrow$       $\downarrow$       $\downarrow$       $\downarrow$   
 $2$       $1$       $3$       $0$

$$\frac{g}{f} = \left\{ \left(2, -\frac{1}{2}\right), \left(0, 4\right) \right\} \quad \text{ج}$$

$$f(x) = \left\{ (1, 2), (3, -1), (5, 2), (-1, 2) \right\} \quad g(x) = \left\{ (-2, 3), (1, -1), (3, 2), (-1, 0) \right\}$$

الف)  $f(2x) = \left\{ \left(\frac{1}{2}, 2\right), \left(\frac{3}{2}, -1\right), \left(\frac{5}{2}, 2\right), \left(-\frac{1}{2}, 2\right) \right\}$

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

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

د)  $\frac{f}{g} = \left\{ \left(1, \frac{2 \times 2}{-1}\right), \left(3, \frac{2 \times (-1)}{2}\right), \left(-1, \frac{2 \times 2}{0}\right) \right\} = \left\{ (1, -4), (3, -1) \right\}$

$$f(x) = \left\{ (2, 1), (3, 1), (5, 9), (-2, 0) \right\} \quad g(x) = \left\{ (2, 1), (2, 3), (-2, 2), (-1, 2), (3, 3) \right\}$$

$$h = 2f + g \rightarrow h = \left\{ (2, 5), (-2, 2), (3, 5) \right\} \quad \text{ج}$$

$$f(x) = \frac{\sqrt{3x} - x}{x-2} \rightarrow D_f = \{x \mid x > 0\} \rightarrow x > 0 \text{ و } \sqrt{3x} - x > 0$$

$$g(x) = [x] + [-x] \rightarrow D_g = [0, 3] - \{2\}$$

$x \in \mathbb{Z} \rightarrow g(x)+1 = 1$   
 $x \notin \mathbb{Z} \rightarrow g(x)+1 = 0$

$x = \{0, 1, 3\}$   
 $D = \{0, 1, 3\}$

$$f(x) = \sqrt{5x - x^2 - 4} \rightarrow 5x - x^2 - 4 \geq 0 \rightarrow -(x^2 + 4 - 5x) \geq 0$$

$$g(x) = \{(1, 2), (2, 2), (3, 4), (4, 1)\}$$

$$h(x) = \frac{f(x)}{g(x)} = \{(1, 0), (2, \frac{\sqrt{1}}{2}), (3, 0)\}$$

$Dg = \{1, 2, 3, 4\}$   
 $Df = [1, 4]$

الف)  $y = \frac{x^5 - 3x^2 + 3x - 1 + 1}{(x-1)^5} \rightarrow y-1 = (x-1)^5 \rightarrow x-1 = \sqrt[5]{y-1}$   
 $x = 1 + \sqrt[5]{y-1}$

ب)  $y = \frac{1}{x^5 - 3x^2}$   $\rightarrow yx^5 - 3yx^2 = 1$

ج)  $x^5y - 3xy - 1 = 0$   $\xrightarrow{y \neq 0} x = \frac{3y \pm \sqrt{9y^2 + 4y}}{2y} \rightarrow 3y(y+1) \geq 0$

د)  $R_f = \mathbb{R}$

الف)  $y = x^5 - 3x^2 + 1$   $\rightarrow x_{\min} = \frac{3}{5} = 2 \rightarrow y_{\min} = 1^5 - 1 + 1 = 1$

ب)  $y = x^5 + 4x + 3$   $\rightarrow x_{\max} = \frac{-4}{5} = -3 \rightarrow y_{\max} = -9 + 11 + 3 = 12$

ج)  $y = \sqrt{x^5 - 3x^2 - 3}$   $\rightarrow x_{\min} = \frac{3}{5} = 2 \rightarrow y_{\min} = 1^5 - 1 - 3 = -3$

د)  $y = \sqrt{4x - x^5}$   $\rightarrow x_{\max} = \frac{4}{5} = 3 \rightarrow y_{\max} = 11 - 9 = 2$

الف)  $y = x^5 - 5x^2 + 3x + 1$   $\rightarrow R_f = \mathbb{R}$

ب)  $y = x^5 - 4x^2 + 3x + 2$   $\rightarrow R_f = \mathbb{R}$

ج)  $y = \sqrt{x^5 - 4x^2 + 5x + 1}$   $\rightarrow R_f = [0, +\infty)$

د)  $y = (x^5 - 3x^2 + 3x + 1)^2$   $\rightarrow R_f = [0, +\infty)$

الف)  $y = \frac{3x+1}{x-2}$   $\rightarrow R_f = \mathbb{R} - \{2\}$

ب)  $y = \frac{2x+1}{x+1}$   $\rightarrow R_f = \mathbb{R} - \{1\}$