

الف - $y = x^2 + 5$
 $x^2 = y + 5 \rightarrow x = \pm \sqrt{y+5}$
 $y+5 \geq 0$
 $y \geq -5 \rightarrow R = [-5, +\infty)$

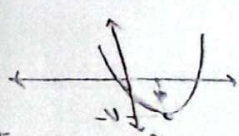
ب - $y = x^2 + 1$
 $x^2 = y - 1 \rightarrow x = \pm \sqrt{y-1}$
 * عدد داخل بافرجای فرد همداره
 برابر $R = R$

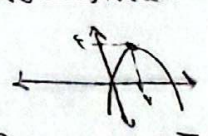
الف - $y = x^2 - 4x + 4$
 $y = x^2 - 4x + 4 + 4$
 $y = (x-2)^2 + 4$
 $y-4 = (x-2)^2$
 $\sqrt{y-4} = x-2$
 $\sqrt{y-4} + 2 = x$
 $y-4 \geq 0 \rightarrow y \geq 4 \rightarrow R = [4, +\infty)$

ب - $y = x^2 - 4x + 1$
 $y = x^2 - 4x + \frac{16}{4} - \frac{15}{4}$
 $y = (x-2)^2 - \frac{15}{4}$
 $y + \frac{15}{4} = (x-2)^2$
 $\sqrt{y + \frac{15}{4}} = x - 2$
 $x = \sqrt{y + \frac{15}{4}} + 2$
 $y + \frac{15}{4} \geq 0$
 $y \geq -\frac{15}{4}$
 $R = [-\frac{15}{4}, +\infty)$

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

ب - $y = \frac{2|x|+1}{|x|-4} = g$
 $|x| = \frac{-2g-1}{g-4} = \frac{2g+1}{g-4}$
 $\frac{1}{1} = \frac{2g+1}{g-4}$
 $1g+1=0$
 $1g=-1$
 $g=-\frac{1}{1}$
 $R = (-\infty, \frac{1}{4}] \cup (2, +\infty)$

الف - $y = x^2 - 4x + 4$
 $x = \frac{-b}{2a} = \frac{4}{2} = 2$
 $y = 9 - 16 + 4 = -1$
 $a > 0 \rightarrow \text{Min} \rightarrow U$

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

ب - $y = -x^2 + 4x + 4$
 $x = \frac{-b}{2a} = \frac{-4}{-2} = 2$
 $y = -4 + 16 + 4 = 16$
 $a < 0 \rightarrow \text{Max} \rightarrow \cap$

 $R = (-\infty, 16]$

الف - $y = \sqrt{x^2 - 4x + 4}$
 $x = \frac{-b}{2a} = \frac{4}{2} = 2$
 $y = 9 - 16 + 4 = -1$
 $a > 0 \rightarrow \text{Min} \rightarrow U$
 $R = \sqrt{[-1, +\infty)} = [0, +\infty)$
 * زیرا x از منفی خارج نمیشود.

ب - $y = \sqrt{-x^2 + 4x + 4}$
 $x = \frac{-b}{2a} = \frac{-4}{-2} = 2$
 $y = -4 + 16 + 4 = 16$
 $a < 0 \rightarrow \text{Max} \rightarrow \cap$
 $R = \sqrt{(-\infty, 16]} = [0, 4]$
 * زیرا x از منفی خارج نمیشود.

$$g = \frac{1}{x^2 - 4x}$$

$$x^2 g - 4xg = 1$$

$$x^2 g - 4xg - 1 = 0$$

معادله درجه دوم

$$\begin{cases} a = g \\ b = -4g \\ c = -1 \end{cases}$$

$$x = \frac{4g \pm \sqrt{16g^2 - 4g^2(-1)}}{2g}$$

با ضربی در بیش مساوی سوال بین مساویات - معادله را ساده شود

$$14y^2 - 4xgx - 1 = 14y^2 + 4xg$$

$$14y^2 + 4xg > 0$$

$$4g(4g+1) > 0$$

ساختن نامزد صفرها

$$\begin{matrix} 4g = 0 & 4g+1 = 0 \\ g = 0 & 4g = -1 \\ & g = -\frac{1}{4} \end{matrix}$$

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

$$-g = \sqrt{x^2 + 4x^2 + 4x + 1}$$

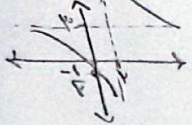
$$R = \overline{R} = [0, +\infty)$$

* زیرا اعداد حقیقی جذ را نمی دهند.

$$\text{الف} - g = \frac{3x+1}{x-2} \rightarrow x=2$$

درستی هنجار: $x = 2$: جواب قائم
درستی هنجار: $g = \frac{a}{c}$

$$g = \frac{a}{c} = \frac{3}{1} = 3 \rightarrow g = \frac{0+1}{0-2} = -\frac{1}{2}$$



$$R = R - \left\{ \frac{a}{c} \right\} = R - \{3\}$$

$$\text{ب} - g = \sqrt{\frac{3x+1}{x+2}}$$

$$x = -\frac{3}{2}$$

$$g = \frac{a}{c} = \frac{3}{1} = 3$$

$$R = \overline{R - \{3\}} = [0, +\infty) - \{3\}$$

$$\text{الف} - g = \frac{3x+1}{x-2}$$

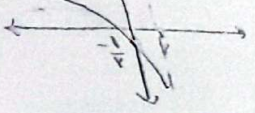
* راه حل با الی اشاره شده است.

$$x=2$$

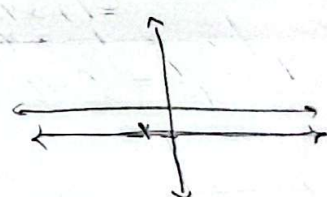
$$g = \frac{a}{c} = \frac{3}{1} = 3$$

جایگذاری صفر

$$\rightarrow g = \frac{0+1}{1-2} = -\frac{1}{2}$$



$$\text{ب} - g = \frac{3x-2}{1-4x} = \frac{2(3x-1)}{1-4x} = -2$$



ساده می شود.

$$\text{الف} - g = \cos^2 x + \frac{1}{\cos^2 x}$$

* زیرا اعداد مربع معکوس مثبت است.

$$R = [2, +\infty)$$

$$\text{ب} - g = \sqrt{\frac{x^2+1}{x}} = \sqrt{\frac{x^2}{x} + \frac{1}{x}} = \sqrt{x + \frac{1}{x}}$$

$$R = \overline{(-\infty, -2] \cup [2, +\infty)}$$

$$= (-\infty, -2] \cup [2, +\infty)$$