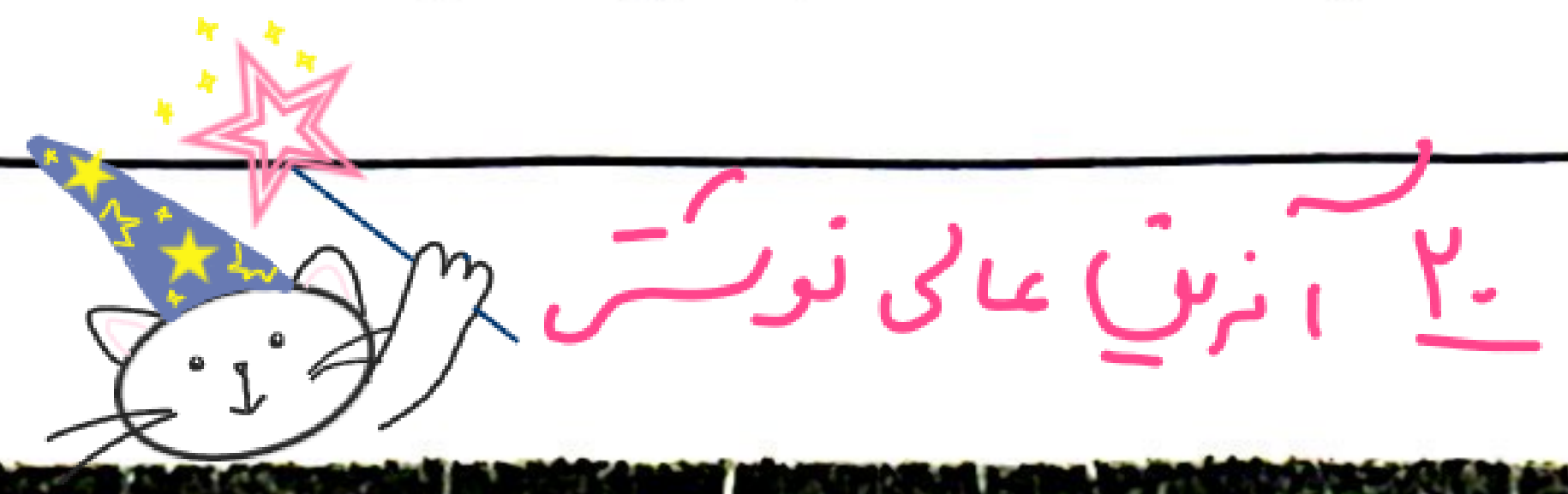




$$f(x) = \sqrt{x-4} + 2\sqrt{x-4} + 4 = \sqrt{(x-4)+4} = |\sqrt{x-4} + 2| = \sqrt{x-4} + 2$$

همواره مثبت

$$g(x) = \sqrt{x-4-4\sqrt{x-4}+4} = \sqrt{(\sqrt{x-4}-2)^2} = |\sqrt{x-4}-2| \xrightarrow{x \geq 4} \sqrt{x-4} - 2$$

$$\rightarrow f(x) + g(x) = \sqrt{x-4} + 2 + \sqrt{x-4} - 2 = 2\sqrt{x-4} \rightarrow a=0, b=2, c=-4 \rightarrow \frac{a+b}{c} = \frac{2}{-4} = -\frac{1}{2}$$

$$f(2) = \frac{4}{4-8+3} = -4 \rightarrow f(x) = \left\{ (2, -4), (0, \frac{2}{3}) \right\}$$

به ازای استرک دافنه و تابع

$$f(1) = \frac{3}{1-4+3} = \text{تعریف نشده}$$

$$f(3) = \frac{5}{9-12+3} = \text{تعریف نشده}$$

$$f(0) = \frac{2}{3}$$

$$\Rightarrow \frac{g}{f} = \left\{ (2, -\frac{1}{4}), (0, 7) \right\}$$

الف)  $f(2x) = \left\{ (\frac{1}{2}, 2), (\frac{3}{2}, -1), (2, 2), (\frac{1}{2}, 7) \right\}$

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

ج)  $2g^2(x) + 1 = \left\{ (-2, 19), (1, 3), (3, 9), (-1, 1) \right\}$

د)  $\rightarrow D_f \cap D_g = \{1, 3, -1\} \rightarrow \frac{2f}{g} = \left\{ (1, 4), (3, -1), (-1, \frac{1}{3}) \right\} = \left\{ (1, -4), (3, -1) \right\}$

تعریف نشده

$$D_f \cap D_g = \{2, -2, 3\}$$

$$\rightarrow 2f + g = \left\{ (2, 5), (-2, 7), (3, 5) \right\}$$

$\downarrow$   $\downarrow$   $\downarrow$   
 $2(1)+3$   $2(0)+7$   $2(1)+3$

$$D_f \rightarrow \begin{cases} \sqrt{3x} - x \geq 0 \rightarrow \sqrt{3x} \geq x \rightarrow 3x \geq x^2 \rightarrow x^2 - 3x \leq 0 \rightarrow x \in [0, 3] \\ x \neq 2 \end{cases}$$

معین نفاذ توصیفات کامل ت

$$D_g = \left\{ \begin{array}{c} \bullet \bullet \bullet \bullet \rightarrow \text{درای } x \text{ های صحیح منفی} \\ \circ \circ \circ \circ \rightarrow \text{شده درای } x \text{ های غیر صحیح} \\ - \text{ من شود پس، توجه به اشیاء} \\ \text{در تابع } \frac{f}{g+1} \text{ معرجه باید منفی شود، } x \text{ های} \end{array} \right.$$

غیر صحیح از دامنه تابع حذف می شوند

$$\Rightarrow D_f \cap D_g = \{0, 1, 3\}$$

$$\omega x - x^r - r > 0$$

$$x^r - \omega x + r < 0 \rightarrow (x-r)(x-1) < 0 \quad \frac{1}{+} \frac{r}{-} \rightarrow D_f: [1, r]$$

$$\rightarrow D_f \cap D_g = \{1, r, r\} \rightarrow h(x) = \left\{ \left( 1, \underset{\substack{\downarrow \\ \frac{0}{r} = 0}}{0} \right), \left( r, \underset{\substack{\downarrow \\ \frac{\sqrt{1-r-r}}{r} = \frac{\sqrt{r}}{r}}}{\frac{\sqrt{r}}{r}} \right), \left( r, \underset{\substack{\downarrow \\ = \frac{0}{r} = 0}}{0} \right) \right\}$$

$$\text{الف) } x^r - r x^r + r x - 1 + 1 = y \rightarrow y = (x-1)^r + 1$$

$$y-1 = (x-1)^r \rightarrow x-1 = \sqrt[r]{y-1} \rightarrow x = \sqrt[r]{y-1} + 1$$

$$R_f = \mathbb{R}$$

$$\text{ب) } y = \frac{1}{x^r - r x} \rightarrow y x^r - r x y - 1 = 0$$

$$x = \frac{r y \pm \sqrt{r^2 y^2 + 4 y}}{2 y}$$

$$r y^2 > -4 y$$

$$y^2 + y > 0$$

$$\frac{-1}{+} \frac{0}{-} \rightarrow R_f = (-\infty, -1] \cup (0, +\infty)$$

$$\text{الف) } \text{ext} \left[ \begin{array}{l} x = \frac{-b}{r a} = \frac{r}{r} = 1 \\ (r)^r - r(r) + 1 = r - r + 1 = 1 \end{array} \right] \xrightarrow{\alpha > 0} R_f = [1, +\infty)$$

$$\text{ب) } \text{ext} \left[ \begin{array}{l} x = \frac{-b}{r a} = \frac{-7}{-r} = \frac{7}{r} \\ y = 18 - 9 = 9 \end{array} \right]$$

$$\text{ب) } \text{ext} \left[ \begin{array}{l} x = \frac{-b}{r a} = \frac{-7}{-r} = \frac{7}{r} \\ y = -9 + 18 + r = 9 \end{array} \right] \xrightarrow{\alpha < 0} R_f = (-\infty, 18]$$

$$\xrightarrow{\alpha < 0} \sqrt{(-\infty, 9]} = [0, 3]$$

$$\text{ج) } \text{ext} \left[ \begin{array}{l} x = \frac{-b}{r a} = \frac{r}{r} = 1 \\ r - 18 - r = -18 \end{array} \right] \xrightarrow{\alpha > 0} R_f = [0, +\infty)$$

$$\text{الف) } R_f = \mathbb{R} \quad \text{ب) } R_f = \mathbb{R}$$

$$\text{ج) } R_f = [0, +\infty)$$

$$\text{د) } R_f = [0, +\infty)$$

$$\text{الف) } R_f = \mathbb{R} - \left\{ \frac{a}{c} \right\} \rightarrow R_f = \mathbb{R} - \{r\}$$

$$\text{ب) } R_f = \mathbb{R} - \{r\}$$