

شماره 28

(آیا حقیقی - دهم دختر B)

$$\left. \begin{array}{l} x^2 + 2x \xrightarrow{x=a} a^2 + 2a \\ ax - 4 \xrightarrow{x=a} a^2 - 4 \end{array} \right\} \Rightarrow a^2 + 2a = a^2 - 4 \rightarrow a = -2 \checkmark$$

(سوال 1)

$$f(x) = \frac{x^2 + a}{bx - b} \xrightarrow{(2,3)} \quad \text{و} \quad \frac{12}{3-b} = \frac{4+a}{3-b} \rightarrow 12 - 3b = 4 + a$$

(سوال 2)

$$12 - 4 = a + 3b \Rightarrow 8 = a + 3b$$

$$g(x) = 2x + b \xrightarrow{(2,3)} \quad \text{و} \quad 3 = 4 + b \rightarrow b = -1$$

$\left. \begin{array}{l} 8 = a + 3b \\ b = -1 \end{array} \right\} \Rightarrow a = 11$

$$f(x) = \frac{x^2 + 11}{2x + 1} \Rightarrow f(1) = \frac{1 + 11}{2 + 1} = \frac{12}{3} = 4 \checkmark$$

$$\Rightarrow R = \{-1, 4\} \Rightarrow x_1 = -1, x_2 = 4$$

(سوال 3)

$$2x^2 + ax + b = 2(x - (-1))(x - 4) = 2(x + 1)(x - 4)$$

$$\Rightarrow 2x^2 - \frac{4x}{a} - \frac{b}{b} \Rightarrow a = -4, b = -8$$

$$f(x) = \frac{4x + 1}{2x^2 - 4x - 8} \rightarrow f(1) = \frac{4 + 1}{2 - 4 - 8} = \frac{-5}{-10} = \frac{1}{2} \checkmark$$

$$x = -1 \rightarrow -kx^2 + ax + b \Rightarrow -k(-1)^2 + a(-1) + b$$

(سوال 4)

صفر

$$-k - a + b = 0 \rightarrow b - a = k$$

$$-k(x - (-1))^2 = 0 \rightarrow -k(x^2 + 2x + 1) = 0 \rightarrow -kx^2 - \frac{2kx}{a} - \frac{k}{b} = 0$$

$$a = -1, b = -2 \rightarrow a + b = -1 - 2 = -3 \checkmark$$

$$\underbrace{(x^p + mx + 1)}_{(\Delta < 0) \text{ صحت } \Delta < 0} \cdot (x-1) \rightarrow \frac{(x-1)(x-1)(x-1)}{(x-1)^p} = (x-1)^{3-p} \quad (\text{سوال 3})$$

$$\textcircled{1} \Delta = b^p - kac = m^p - k(1)(1) = m^p - k < 0 \rightarrow -p < m < p$$

$$\textcircled{2} x^p + mx + 1 \xrightarrow{x=1} 1 + m + 1 = 0 \rightarrow m + 2 = 0 \rightarrow m = -2$$

$$\Rightarrow -p \leq m \leq p \quad \checkmark$$

$$f(x) = \sqrt{k - \frac{1}{x^p}} \rightarrow \sqrt{k - \frac{1}{x^p}} \geq 0 \rightarrow \sqrt{(x - \frac{1}{x})(x + \frac{1}{x})} \geq 0 \quad (\text{سوال 4})$$

$$x - \frac{1}{x} \geq 0 \rightarrow x \leq \frac{1}{x} \quad x + \frac{1}{x} \geq 0 \rightarrow x \geq -\frac{1}{x}$$

$$x^2 \leq 1 \rightarrow x \leq \frac{1}{x} \quad -x^2 \geq 1 \rightarrow x \geq -\frac{1}{x}$$

$$\frac{1}{x} \geq x \geq -\frac{1}{x} \quad \checkmark$$

$$f(x) = \sqrt{mx^p + px + 1} \quad (\text{سوال 7})$$

$$\textcircled{m=0} \rightarrow \cancel{0}x^p + p\cancel{0}x + 1 = 1 \Rightarrow m = 1$$

$$\textcircled{m > 0} \rightarrow \Delta = b^p - kac \leq 0 \Rightarrow (pm)^p - k(m)(1) = km^p - km$$

$$\frac{pm(m-1)}{+} \leq 0 \quad \left. \begin{array}{l} m > 0 \rightarrow pm + \\ m-1 \geq 0 \rightarrow m \geq 1 \end{array} \right\} \Rightarrow m = [0, 1] \quad \checkmark$$

$$f(x) \begin{cases} \frac{px^r - 1}{px - 1} : x \neq \frac{1}{p} \rightarrow \frac{(px-1)(px+1)}{px-1} & g(x) = px + 1 \\ px + k : x = \frac{1}{p} \end{cases} \quad (\text{سوال 1})$$

$$f(x) = g(x) \Rightarrow x = \frac{1}{p} \quad f\left(\frac{1}{p}\right) = k + p\left(\frac{1}{p}\right) + 1 = p + k$$

$$p + k = p \rightarrow k = 0$$

$$f(x) = px + 1$$

$$\rightarrow a = p, k = 0 \rightarrow a + k = p + 0 = p \quad \checkmark$$

$$f(x) \begin{cases} \frac{x^p - f}{x + r} : x \neq -\frac{r}{p} \\ pax + r : x = -\frac{r}{p} \end{cases} \quad g(x) = px + b \quad \text{(سوال 9)}$$

$$\frac{(px - r)(\cancel{px + r})}{\cancel{px + r}} \begin{cases} px - r \rightarrow px - r = px + b \Rightarrow b = -r \\ pax + r \end{cases}$$

$$f(x) = pa(-\frac{r}{p}) + r = -ra + r$$

$$g(x) = p(-\frac{r}{p}) + b = -r + (-r) = -2r \quad \begin{cases} -ra + r = -2r \\ -ra = -3r \Rightarrow a = 3 \end{cases}$$

$$a - b = 3 - (-2) = 5 \quad \checkmark$$

$$f(x) \begin{cases} \frac{x^p - \varepsilon}{x - r} \quad x \neq r & \frac{(x-r)(x+r)}{x-r} \Rightarrow x+r \\ pa^p + ax \quad x=r \rightarrow pa^p + pa = \varepsilon \rightarrow pa^p + pa - \varepsilon = 0 \end{cases} \quad \text{(سوال 10)}$$

$$a^p + a - r = 0 \rightarrow (a+r)(a-1) = 0 \rightarrow a+r = 0 \Rightarrow a = -r \quad \checkmark$$

$$\hookrightarrow a-1 = 0 \Rightarrow a = 1 \quad \checkmark$$