

$$f(x) = \begin{cases} x^{n-1} & x \geq 0 \\ x^n + x^{n+1} & x < 0 \end{cases}$$

سوال ۱: (۲)

$$x^{n+1} \geq 0 \quad x \geq 0 \quad (۲)$$

$$x \geq -\frac{x}{x} \quad x < 0 \quad (۱)$$

$$(۱) + (۲) \Rightarrow \left[-\frac{x}{x}, +\infty\right) \checkmark$$

$$\frac{x^{n+1} + x^{n+2} + x^{n+3}}{(x^{n+1})^2} = \frac{x}{x^{n+1}} \checkmark$$

سوال ۲: (۲)

$$D_f = \mathbb{R} - \left\{-\frac{1}{x}\right\} \checkmark$$

$$n=0 \Rightarrow f(x) = \frac{-1}{-1} = 1 \Rightarrow c=1 \checkmark$$

سوال ۳: (۲)

$$\left. \begin{aligned} g(x) \xrightarrow{x \rightarrow 1} \infty &= \frac{a+x}{b+1} \\ g(x) \xrightarrow{x \rightarrow -1} 1 &= \frac{1-a}{b-1} \end{aligned} \right\} \Rightarrow \begin{aligned} a &= 1-b \\ b &= \frac{1}{x} \\ b+b &= \frac{1}{x} \end{aligned}$$

$$n=0 \rightarrow \frac{-1}{c} = \frac{-1}{b} \rightarrow c=b$$

سوال ۴: (۲)

$$\begin{aligned} x^n + ax + b &= (x-c)^n = x^n - nx^{n-1}c + \dots + c^n \Rightarrow b=c^n \\ a &= -nc = -1 \quad a+b+c=0 \checkmark \end{aligned}$$

$$(x-1)^n x + (x+1)^n (-x) = x((x-1)^n - (x+1)^n) = -1x^n \checkmark$$

(۲)

$$(-1)^n = 1 \Rightarrow -1 = 1^n \Rightarrow n = -1 \quad (۲): \text{سوال ۵}$$

$$1 - 1^n = -1 \Rightarrow n = 1 \rightarrow \sqrt[n]{1} = 1 \rightarrow \sqrt[n]{1} + 1 = 2 \quad (۱)$$

$$\Rightarrow f(-1) + f(1) = 1 + 1 = 2 \checkmark$$

$$x + \sqrt{x} = 7 \Rightarrow t^2 + t - 7 = 0 \quad t = -1 \times$$

$$t = 1$$

$$\sqrt{x} = 1 \Rightarrow x = 1$$

$$f(x) = 1^2 + 1 \times 1 = 2 \quad \checkmark$$

سوال ۱۰

(۲)

$$(x-1)^2 + (x-1) + (1-x^2) + (1+x) = 0 \quad \checkmark \quad (۲) \quad \text{سوال ۱۱}$$

$$xf - g = \{(1, k)\} \quad D_{g \cap f} = \{1\} \Rightarrow \frac{x}{x} a = \frac{b}{x} = \quad \text{سوال ۱۲}$$

$$D_f = \{x\}, \frac{x}{x} a \Rightarrow xa = b = k \quad \checkmark \quad (۲)$$

$$D_g = \{x\} \leq \frac{b}{x}$$

$$a = \frac{k}{x}$$

$$f(1) = k-1 \Rightarrow \{f(1) = k-1\} \Rightarrow \{f(1) - g(1) = -(k+1) = k\}$$

$$g(1) = k$$

$$ka - \frac{b}{x} - k = \checkmark \quad k = -1$$

$$\{x+t\} > 0$$

$$x > -1$$

$$D_f = [-1, 1]$$

$$\left. \begin{array}{l} m-x > 0 \\ m > x \\ x > m \end{array} \right\} \Rightarrow m = x \quad \checkmark \quad \text{سوال ۱۳}$$

(۲)

$$\left. \begin{array}{l} g(m) = \sqrt{x} = 1\sqrt{x} \\ f(x) - 1\sqrt{x} = 1\sqrt{x} \end{array} \right\} \Rightarrow f(x) = 1\sqrt{x}$$

$$\sqrt{x-k} + k = 1\sqrt{x}$$

$$x = 1\sqrt{x-k}$$

$$k + m = 1\sqrt{x-k} - k + 1 = 1\sqrt{x-k} \quad \checkmark$$