

نام و نام خانوادگی: پاسخنامه تشریحی تکلیف شماره ۲ کلاس: ریاضی پایه

$$f(x) = x^4 + px^3 + qx^2 + rx + mn \Rightarrow 10x^4 + mx^2 + 6x + nx + p + mn =$$

$$(10+0)x^4 + (-6+n)x^3 + mn = 10x^4 + mx^2 + 6x + nx + p + mn \Rightarrow -6+n=0 \Rightarrow n=6 \text{ و } 10+m=0 \Rightarrow m=-10$$

$$g(x) = \left\{ \underbrace{(6, -10)}_{p+1=-10 \Rightarrow p=-11}, \underbrace{(6, p+1)}_{-1=-11+K \Rightarrow K=10}, \underbrace{(p, -1)}_{-1=-11+K \Rightarrow K=10}, \underbrace{(-9, p+K)}_{m+n+p+K=-10+6+11+10=7} \right\}$$

الف) $x^2 - 2 = 0 \Rightarrow x = 2$ ریشه صحیح: $x^2 + t = t^2 - 2t - 1 = 0 \Rightarrow (t-4)(t+1) = 0 \Rightarrow \begin{cases} t=4 \Rightarrow x=2, -2 \\ t=-1 \Rightarrow x \end{cases}$

$$\frac{x^2}{x^4 - 2x^2 - 1} \geq 0 \Rightarrow \frac{x^2}{-x^2 + 1} \geq 0 \Rightarrow D_f = (-2, +\infty) \cup \{2\}$$

ب) $6 - 2[-x] \neq 0 \Rightarrow 2[-x] \neq 6 \Rightarrow [-x] \neq 3 \Rightarrow 2 \leq -x < 3 \Rightarrow -3 < x \leq -2$

$$D_f = R - (-3, -2]$$

الف) $x(x^2 - 1) \geq 0 \Rightarrow x(x-1)(x+1) \geq 0 \Rightarrow \frac{-1}{x+1} - \frac{1}{x} \in [1, +\infty) \cup [-1, 0]$

$$|x+2| \geq 0 \Rightarrow \begin{cases} x \geq 0 \Rightarrow 2x \\ x < 0 \Rightarrow -x+2=0 \Rightarrow x=2 \end{cases} \Rightarrow (0, +\infty) \cup \{2\} \quad I \cap II = [1, +\infty)$$

ب) $|x-1| - x^2 \geq 0 \Rightarrow x^2 - |x-1| \leq 0 \Rightarrow \begin{cases} x \geq 1 \Rightarrow x^2 - x + 1 \leq 0 \Rightarrow (x-1/2)^2 \leq -3/4 \text{ (no solution)} \\ x < 1 \Rightarrow x^2 - x + 1 \leq 0 \Rightarrow (x-1/2)^2 \leq -3/4 \text{ (no solution)} \end{cases}$

$$|x+1| - 1 = K \Rightarrow |x+1| = K+1 \Rightarrow \begin{cases} x+1 = K+1 \Rightarrow x=K \\ x+1 = -(K+1) \Rightarrow x=-K-2 \end{cases}$$

$$|x-1| - 1 = -K \Rightarrow |x-1| = 1-K \Rightarrow \begin{cases} x-1 = 1-K \Rightarrow x=2-K \\ x-1 = -(1-K) \Rightarrow x=0 \end{cases}$$

$$K+3 = -K+1 \Rightarrow 2K = -2 \Rightarrow K = -1$$

$$K+1 = -K+3 \Rightarrow 2K = 2 \Rightarrow K=1 \checkmark$$

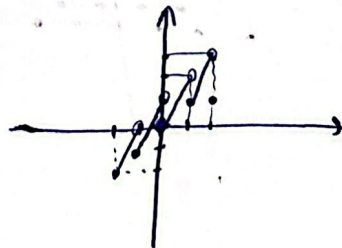
$$-1 < x < 1 \Rightarrow y = 2x+2$$

$$-1 < x < 0 \Rightarrow y = 2x+1$$

$$0 < x < 1 \Rightarrow y = 2x$$

$$1 < x < 2 \Rightarrow y = 2x-1$$

$$x=2 \Rightarrow y = 2x-2$$



$$f(x) = \frac{x^2 - 5x + 3 + bx + ab}{x+a} = x \Rightarrow x^2 + (-5+b)x + ab = x^2 + ax$$

$$-5+b=a \Rightarrow a-b=-5$$

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$$f(x) = \frac{x^2 + 2x - 2}{x^2 - 1}; x \neq \pm 1 \Rightarrow f(x) = \frac{(x^2 - 1)(x+2)}{x^2 - 1} = x+2$$

$$g(x) = x+c \xrightarrow{f(x)=g(x)} \boxed{c=2}$$

$$x=1 \Rightarrow g(x)=f(x)=3 = \frac{a+2}{1+b} \Rightarrow a+b=1$$

$$x=-1 \Rightarrow g(x)=f(x)=1 = \frac{2-a}{b-1} \Rightarrow a+b=3 \Rightarrow a=\frac{2}{3}, b=\frac{1}{3}$$

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$$D_f = [1, +\infty) \quad \{x-3a\}_+ = \{x\}_+^3 a \Rightarrow x \geq \frac{3a}{f} \Rightarrow \frac{3a}{f} = 1 \Rightarrow 3a = f \Rightarrow a = \frac{f}{3}$$

$$D_g = (-\infty, 1] \quad b - \{x\}_+ = \{x\}_+^3 b \Rightarrow x \leq \frac{b}{f} \Rightarrow \frac{b}{f} = 1 \Rightarrow b = f$$

$$x\sqrt{f(1)-f} + 2K - 2 = \sqrt{f-f(1)} - 3K = -K - 2 = 2K - 2 \Rightarrow K = -1$$

$$f\left(\frac{f}{3}\right) = \frac{f}{3} - (-1) = f - 2 + 1 = f - 1$$

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$$D_{f \cap g} = [-1, 2] \quad D_g \Rightarrow 2x+2 \geq 0 \Rightarrow x \geq -1$$

$$D_f \Rightarrow m-x \geq 0 \Rightarrow x \leq m \Rightarrow \boxed{m=2}$$

$$f(m) - g(m) = \sqrt{2-m} + n - \sqrt{1} = 2+n-\sqrt{1} = 2\sqrt{2} \Rightarrow 2+n = 1\sqrt{2} \Rightarrow n = 1\sqrt{2} - 2$$

$$m+n = 1\sqrt{2} - 2 + 2 = 1\sqrt{2}$$

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$$y = x - [x]$$



$$\text{für } x \Rightarrow -1 \leq x < 0$$

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