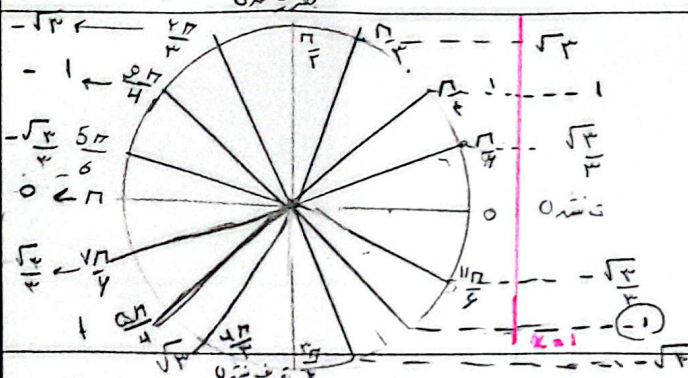


نام و نام خانوادگی: شماره: کلاس: نام: A



1

الف) $\sin \frac{\pi}{6} + \cos \pi + 2 \tan \frac{\pi}{4} = \frac{1}{2} + (-1) + 2(-1) = -\frac{3}{2}$

ب) $-\cos \frac{5\pi}{6} + \sin \frac{\pi}{3} - 2 \sin \frac{\pi}{4} = -(-\frac{\sqrt{3}}{2}) + (\frac{\sqrt{3}}{2}) - 2(\frac{\sqrt{2}}{2}) = \frac{\sqrt{3}}{2}$

ج) $\cot \frac{\pi}{3} + \cot \frac{\pi}{4} - 2 \tan \frac{\pi}{6} = -\frac{\sqrt{3}}{3} + 1 - 2(\frac{1}{\sqrt{3}}) = \frac{\sqrt{3}}{3}$

د) $(\cos(\sin \pi) + \sin(\pi \cos \frac{\pi}{6})) = (\cos(0) + \sin(\frac{\pi}{2})) = 1 + 1 = 2$

2

$$\left. \begin{aligned} f(a) &= a^2 + 2a \\ f(a) &= 2a + a + 2 = 3a + 2 \end{aligned} \right\} \Rightarrow a^2 + 2a = 3a + 2$$

$$a^2 + 2a - 3a - 2 = 0 \Rightarrow a^2 - a - 2 = 0 \Rightarrow a = 1 \text{ or } a = -2$$

3

$$\begin{aligned} |x+1| \geq 2 &\Rightarrow x \geq 1 \text{ or } x \leq -3 \\ \Rightarrow a+b &= 25 \\ f(x) &= \begin{cases} 2x^2 - b & \text{if } x \geq 1 \\ a + 2x & \text{if } x < 1 \end{cases} \end{aligned}$$

4

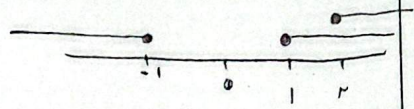
الف) $x^2 - 2x \neq 0 \Rightarrow x^2(x-2) \neq 0 \Rightarrow x \neq 2, 0 \quad D_f = \mathbb{R} - \{0, 2\}$

ب) $2x^2 + 2x - 2x - 2 = 2x^2 + 2x - 2x - 2 = 2x^2 - 2 = 0 \Rightarrow 2x(x-1) + 2(x+1) = 0$

$(x^2+1)(2x+2) \neq 0 \Rightarrow \begin{cases} (x^2+1) \neq 0 \text{ } \forall x \in \mathbb{R} \\ 2(x+1) \neq 0 \Rightarrow x \neq -1 \end{cases} \quad x \in \mathbb{R} - \{-1\}$

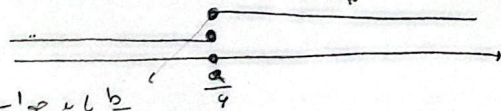
5

الف) $x^2 - 1 \geq 0 \Rightarrow x \geq 1$ or $x \leq -1$ (1) $x - 2 \geq 0 \Rightarrow x \geq 2$ $D_F = [2, \infty)$



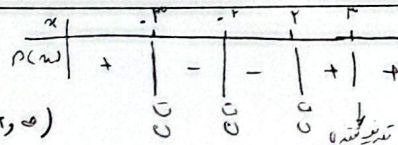
ب) $4 - 2x \geq 0 \Rightarrow x \leq 2$
 $4x - 2 > 0 \Rightarrow x > \frac{1}{2}$
 $D_F = (\frac{1}{2}, 2]$

الف) $4x - 2 \geq 0 \Rightarrow x \geq \frac{1}{2}$ $b - 2x \geq 0 \Rightarrow x \leq \frac{b}{2}$ $\frac{a}{4} - \frac{b}{2} = 2 \Rightarrow a = 12, b = 4, \frac{b}{a} = \frac{1}{3}$



ب) $\frac{b}{2} \leq x \leq \frac{a}{4}$ جواب برای باشند
 ۱- بازه‌ی جواب $\emptyset$ نشود
 ۲- بیش از یک جواب یافت باشند پس $\frac{1}{4} = \frac{b}{2}$

الف) صورت $= (x-3)(x+2) - 2, 2$
 مخرج $= (x^2 - 4)(x^2 - 9) \pm 2, \pm 2$
 $D_F = (-\infty, 2) \cup (2, \infty)$



ب) صورت $= (x-1)(x^2 + ax - 4)$
 $\begin{cases} x^2 - x^2 = -2x^2 \\ -ax - 4x = -ax \end{cases} \Rightarrow a = -1$
 $\begin{cases} (x-1)(x-3)(x+2) \\ (x+1)(x+3)(x-2) \end{cases}$
 $D_F = (-\infty, -1) \cup [-1, -3) \cup [-2, 2) \cup (2, 3) \cup (3, \infty)$

الف) $2[x] - 2 \geq 0 \Rightarrow [x] \geq 1 \Rightarrow x \in [1, +\infty)$

ب) $2[x] - 5 \geq 0 \Rightarrow [x] \geq \frac{5}{2} \Rightarrow x \in [2.5, +\infty)$

الف) $|x-3| \neq 0 \Rightarrow x \neq 3$
 $x+1 \geq 0 \Rightarrow x \geq -1$
 $4-x \geq 0 \Rightarrow x \leq 4$
 $\Delta < 0 \Rightarrow$ حتماً مثبت

$\begin{cases} 4 \geq x \\ -1 \leq x \leq 4 - \{3\} \end{cases} \Rightarrow x \in [-1, 3) \cup (3, 4]$

ب) $[x] - 2 \geq 0 \Rightarrow [x] \geq 2 \Rightarrow x \in [2, \infty)$

$2 - [x] \geq 0 \Rightarrow [x] \leq 2 \Rightarrow x \in (-\infty, 3)$

