

پاسخ سوالات ۱ تا ۲

$$x^2 - 6x = 0 \Rightarrow x(x - 6) = 0 \Rightarrow \begin{cases} x = 0 \\ x = 6 \end{cases}$$

۱

$$2x^2 - 5x - 3 = 0 \Rightarrow \Delta = b^2 - 4ac = 25 + 24 = 49$$

۲

$$\Rightarrow \begin{cases} x_1 = \frac{-b + \sqrt{\Delta}}{2a} = \frac{5 + 7}{4} = 3 \\ x_2 = \frac{-b - \sqrt{\Delta}}{2a} = \frac{5 - 7}{4} = -\frac{1}{2} \end{cases}$$

پاسخ سؤال ۳

صفر

۳

پاسخ سوالات ۴ تا ۵

$$(x - 5)(x + 2) = 0 \Rightarrow x = 5 \text{ یا } x = -2$$

۴

$$\begin{cases} a = 2 \\ b = -7 \\ c = 3 \end{cases} \Rightarrow \Delta = 49 - 24 = 25 \Rightarrow x = \frac{7 \pm \sqrt{25}}{4}$$

۵

$$\Rightarrow x = 3 \text{ یا } x = \frac{2}{4} = \frac{1}{2}$$

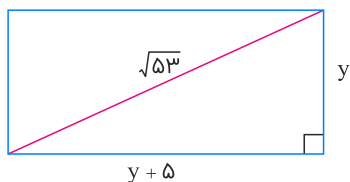
۶

$$\text{طول مستطیل} = x + 3, \text{ عرض مستطیل} = x$$

$$\Rightarrow x(x + 3) = x^2 + 3x = 28$$

$$\Rightarrow x^2 + 3x - 28 = 0 \Rightarrow (x + 7)(x - 4) = 0$$

$$\Rightarrow x = 4 \text{ (ق ق) یا } x = -7 \text{ (غ ق ق)}$$

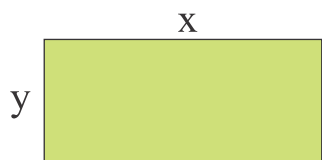


$$x = y + 5 \Rightarrow (y + 5)^2 + y^2 = 5^3 \Rightarrow y^2 + 10y + 25 + y^2 = 5^3$$

$$\Rightarrow 2y^2 + 10y - 28 = 0 \Rightarrow 2(y^2 + 5y - 14) = 0$$

$$\Rightarrow 2(y + 7)(y - 2) = 0 \Rightarrow y = 2 \Rightarrow x = 7$$

مساحت $\Rightarrow xy = 7 \times 2 = 14$



$$2(x + y) = 50 \Rightarrow x + y = 25 \Rightarrow y = 25 - x$$

$$S = xy = x(25 - x) = 144 \Rightarrow x^2 - 25x + 144 = 0 \Rightarrow (x - 9)(x - 16) = 0$$

$$\Rightarrow \begin{cases} x = 9 \Rightarrow y = 16 \\ \text{یا} \\ x = 16 \Rightarrow y = 9 \end{cases}$$

بنابراین طول و عرض مستطیل برابر ۱۶ و ۹ متر هستند.

الف) $x^2 + 4x = \frac{5}{2} \Rightarrow x^2 + 4x + 4 = \frac{5}{2} + 4 \Rightarrow (x + 2)^2 = \frac{13}{2}$

$$\Rightarrow x + 2 = \pm \sqrt{\frac{13}{2}} \Rightarrow x = \pm \sqrt{\frac{13}{2}} - 2$$

ب) $9x^2 - 8x - 1 = 0 \Rightarrow \Delta = 64 + 4 \times 9 = 100$

$$\Rightarrow x = \frac{8 \pm \sqrt{100}}{2 \times 9} = \frac{8 \pm 10}{18} \Rightarrow \begin{cases} x = 1 \\ x = -\frac{1}{9} \end{cases}$$

$$n^2 + (n+1)^2 = 265 \Rightarrow n^2 + n^2 + 2n + 1 = 265 \Rightarrow 2n^2 + 2n - 264 = 0$$

$$\xrightarrow{\div} n^2 + n - 132 = 0 \Rightarrow (n+12)(n-11) \Rightarrow \begin{cases} n = -12 \text{ ق.ق. غ} \\ n = +11 \Rightarrow 11, 12 \end{cases}$$

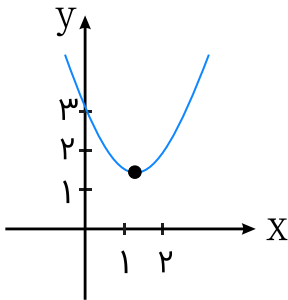
پاسخ سؤال ۱۱

$$x = \frac{1+0}{2} = \frac{1}{2}$$

$$x_S = \frac{-b}{2a} = \frac{4}{4} = 1$$

$$\Rightarrow y_S = 2(1)^2 - 4(1) + 3 = 1$$

$$\Rightarrow S(1, 1)$$



(در نمودار، مختصات دو نقطه دیگر غیر از رأس هم مشخص باشد.)

$$f(0) = -1 \Rightarrow c = -1$$

$$\left. \begin{aligned} f(1) = 0 &\Rightarrow 0 = a + b - 1 \Rightarrow a + b = 1 \\ f(2) = 3 &\Rightarrow 3 = 4a + 2b - 1 \Rightarrow 2a + b = 2 \end{aligned} \right\} \Rightarrow a = 1, b = 0$$

$$f(x) = ax^2 + bx + c$$

$$A(0, 1) \Rightarrow 1 = 0 + 0 + c \Rightarrow 1 = c$$

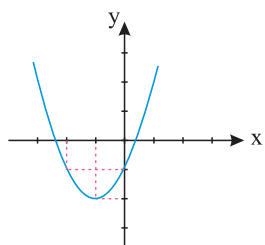
$$\left. \begin{aligned} B(-1, 0) &\Rightarrow 0 = a - b + 1 \Rightarrow a - b = -1 \\ M(1, 4) &\Rightarrow 4 = a + b + 1 \Rightarrow a + b = 3 \end{aligned} \right\} \Rightarrow a = 1, b = 2$$

پاسخ سؤالات ۱۵ تا ۱۶

$$y = (x + 1)^2 - 2$$

رأس سهمی : $(-1, -2)$

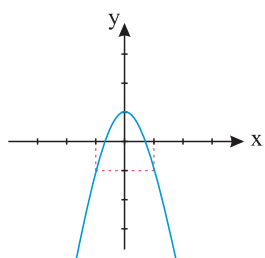
x	-۲	-۱	۰
y	-۱	-۲	-۱



$$y = -2x^2 + 1$$

رأس سهمی : $(0, 1)$

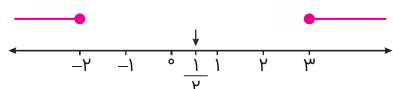
x	-۱	۰	۱
y	-۱	۱	-۱



$$x \geq 3 \Rightarrow x - \frac{1}{2} \geq \frac{5}{2}$$

$$x \leq -2 \Rightarrow x - \frac{1}{2} \leq -\frac{5}{2}$$

$$\left| x - \frac{1}{2} \right| \geq \frac{5}{2}$$



$-x^2 + 2x - 1 = 0 \Rightarrow \Delta < 0 \Rightarrow$ همواره منفی

$x^2 - 2x - 15 = 0 \Rightarrow x = -3, 5$

x	$-\infty$	-3	5	$+\infty$	
$-x^2 + 2x - 1$	-	-	-	-	
$x^2 - 2x - 15$	+	o	-	o	+
p	-	-	+	-	

تعریف نشده تعریف نشده

مجموعه جواب: $(-3, 5)$

$a > 0, \Delta < 0 \Rightarrow (p+1)^2 - 4(p^2)(1) < 0 \Rightarrow p^2 + 2p + 1 - 4p^2 < 0$

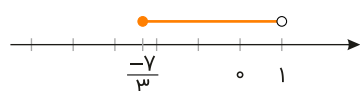
$\Rightarrow 15p^2 - 2p - 1 > 0 \Rightarrow p = \frac{2 \pm \sqrt{4 + 60}}{30} = \frac{2 \pm 8}{30} \Rightarrow \begin{cases} p = \frac{1}{3} \\ p = -\frac{1}{5} \end{cases} \Rightarrow \frac{1}{3} < p, p < -\frac{1}{5}$

$\frac{2x^2 - 16}{x^2 + 3x + 2} - 1 < 0 \Rightarrow \frac{x^2 - 3x - 18}{x^2 + 3x + 2} < 0 \Rightarrow \begin{cases} x^2 - 3x - 18 = 0 \Rightarrow x = -3, x = 6 \\ x^2 + 3x + 2 = 0 \Rightarrow x = -2, x = -1 \end{cases}$

x	$-\infty$	-3	-2	-1	6	$+\infty$	
$x^2 - 3x - 18$	+	o	-	-	-	o	+
$x^2 + 3x + 2$	+	+	o	-	o	+	+
کسر	+	o	-	o	-	o	+



$-2 < 1 - 3x \leq 8 \Rightarrow -3 < -3x \leq 7 \Rightarrow \frac{-7}{3} \leq x < 1 \Rightarrow \left[\frac{-7}{3}, 1 \right)$



$$-1 \leq \frac{2x+1}{3} < 3 \Rightarrow -3 \leq 2x+1 < 9 \Rightarrow -4 \leq 2x < 8 \Rightarrow -2 \leq x < 4$$

مجموعه جواب = $[-2, 4)$

$$\frac{x^3 - x}{x^2 - 2x + 2} \leq 0$$

$$x^3 - x = 0 \Rightarrow x(x^2 - 1) = 0 \Rightarrow x = 0, \pm 1$$

$$x^2 - 2x + 2 = 0 \Rightarrow \Delta = 4 - 4(1)(2) = 4 - 8 = -4 < 0 \text{ ریشه ندارد}$$

	-1	0	1	
x	-	-	0	+
x ² - 1	+	0	-	0
$\frac{x^3 - x}{x^2 - 2x + 2}$	+	+	+	+
	-	+	-	+
	ج		ج	

$$\Rightarrow \text{مجموعه جواب} = (-\infty, -1] \cup [0, 1]$$

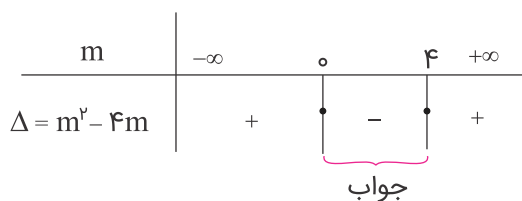
$$|7 - 2x| < 1 \Rightarrow -1 < 7 - 2x < 1 \xrightarrow{-7} -8 < -2x < -6 \Rightarrow 4 > x > 3$$

$$\begin{cases} a > 0 \Rightarrow 2 - m > 0 \Rightarrow m < 2 \\ \Delta < 0 \Rightarrow 16 - 4(2 - m)(-m - 1) < 0 \Rightarrow -4m^2 + 4m + 24 < 0 \Rightarrow -(m - 3)(m + 2) < 0 \end{cases}$$

	-2	3	
$-4m^2 + 4m + 24$	-	0	+
		0	-

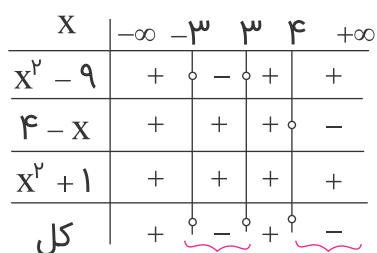
$$\Rightarrow \begin{cases} (-\infty, -2) \cup (3, +\infty) \\ (-\infty, 2) \end{cases} \xrightarrow{\text{اشتراک}} (-\infty, -2)$$

$$\Delta = m^2 - 4m$$



$$\Rightarrow 0 < m < 4$$

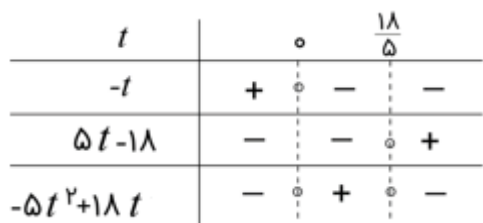
$$\frac{(x^2 - 9)(4 - x)}{x^2 + 1} \leq 0$$



$$x \in [-3, 3] \cup [4, +\infty)$$

$$h > 13 \Rightarrow -\omega t^2 + 18t + 13 > 13 \Rightarrow -\omega t^2 + 18t > 0$$

$$\Rightarrow -t(\omega t - 18) = 0 \Rightarrow \begin{cases} t = 0 \\ t = \frac{18}{\omega} \end{cases}$$



$$t \in (0, \frac{18}{\omega})$$