

١.

$$\text{الف) } x^2 - 4x + 1 = 0 \Rightarrow x^2 - 4x + 4 = 1 \Rightarrow (x-2)^2 = 1 \Rightarrow x-2 = \pm 1 \Rightarrow \begin{cases} x = 3 \\ x = 1 \end{cases}$$

$$\text{ب) } x^2 + 11x + 10 = 0 \Rightarrow x^2 + 11x + 10 = 0 \Rightarrow (x+1)(x+10) = 0 \Rightarrow x+1 = \pm 10 \Rightarrow \begin{cases} x = -1 \\ x = -10 \end{cases}$$

٢.

$$\text{الف) } x^2 - 5x + 4 = 0 \Rightarrow (x-1)(x-4) = 0 \Rightarrow \begin{cases} x = 1 \\ x = 4 \end{cases}$$

$$\text{ب) } x^2 - 5x - 14 = 0 \Rightarrow (x-7)(x+2) = 0 \Rightarrow \begin{cases} x = 7 \\ x = -2 \end{cases}$$

٣.

$$\text{الف) } x^2 - 3x - 5 = 0 \Rightarrow \frac{3 \pm \sqrt{9 + 20}}{2}$$

$$\text{ب) } 2x^2 - 2x + \frac{1}{2} = 0 \Rightarrow \frac{1 \pm \sqrt{1 - 1}}{2}$$

٤.

$$\text{الف) } x^2 - 3x + 2 = 0 \Rightarrow (x-1)(x-2) = 0 \Rightarrow \begin{cases} x = 1 \\ x = 2 \end{cases}$$

$$\text{ب) } 4x^2 + x - 3 = 0 \Rightarrow \frac{-1 \pm \sqrt{1 + 48}}{8} \Rightarrow \begin{cases} x = \frac{3}{4} \\ x = -1 \end{cases}$$

٥.

$$\text{الف) } 5x^2 - 12x + 7 = 0 \Rightarrow x^2 - 12x + 35 = 0 \Rightarrow (x-5)(x-7) = 0 \Rightarrow \begin{cases} x = \frac{5}{5} \\ x = 1 \end{cases}$$

$$\text{ب) } 3x^2 - 10x + 7 = 0 \Rightarrow x^2 - 10x + 21 = 0 \Rightarrow (x-7)(x-3) = 0 \Rightarrow \begin{cases} x = \frac{7}{3} \\ x = 1 \end{cases}$$

۹.

$$\text{الف) } -3m^2 + 5m - 1 = 0 \Rightarrow \frac{-5 \pm \sqrt{25 - 12}}{-6} \Rightarrow \text{دو ریشه}$$

$$\text{ب) } 2m^2 - m + 2 = 0 \Rightarrow \frac{1 \pm \sqrt{1 - 16}}{4} \Rightarrow \text{ریشه ندارد}$$

$$\text{پ) } 2m^2 - 4m + 2 = 0 \Rightarrow \frac{4 \pm \sqrt{16 - 16}}{4} \Rightarrow \text{دو ریشه مساوی یک ریشه دارد (ریشه مضاعف)}$$

$$\text{ت) } 2m^2 - m + 1 = 0 \Rightarrow \frac{1 \pm \sqrt{1 - 8}}{4} \Rightarrow \text{ریشه ندارد}$$

۷.

$$\text{الف) } \Delta > 0 \Rightarrow 9 - 4a > 0 \Rightarrow \frac{9}{4} > a \Rightarrow \frac{1}{4} > a$$

$$\text{ب) } \Delta = 0 \Rightarrow 9 - 4a = 0 \Rightarrow a = \frac{9}{4}$$

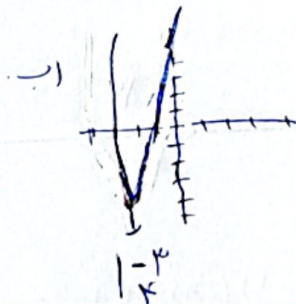
$$\text{ج) } \Delta < 0 \Rightarrow 9 - 4a < 0 \Rightarrow 9 < 4a \Rightarrow \frac{9}{4} < a$$

$$\text{د) } \Delta > 0 \Rightarrow \frac{1}{4} > a$$

۸.

$$y = m^2 + 4m + 5$$

$$\text{الف) } \text{Min} \begin{cases} -3 \\ -4 \end{cases}$$



۹.

$$y = -m^2 + 4m - 3$$

$$\text{الف) } \text{Max} \begin{cases} +2 \\ +1 \end{cases}$$



$$\begin{aligned} \text{ب) } -m^2 + 4m - 3 &= 0 \\ \Rightarrow (m^2 - 4m + 3) &= 0 \\ (m - 1)(m - 3) &= 0 \end{aligned}$$

$$\begin{cases} m = +1 \\ m = +3 \end{cases}$$

$$۱۰. m^2 - 3m - 2 = 0 \Rightarrow m = \frac{3 \pm \sqrt{17}}{2}$$

$$\text{الف) } 9 - (-4) = 13$$

$$\text{ب) } 44 - (-18) = 62$$