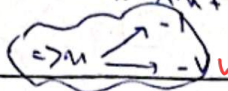


الف) $x^2 - 4x + 8 = 0 \xrightarrow{+4} x^2 - 4x + 16 = 1 \rightarrow (x-2)^2 = 1 \rightarrow x-2 = \pm 1$



۱

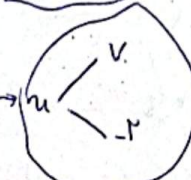
ب) $x^2 + 8x + 17 = 0 \xrightarrow{+9} x^2 + 8x + 18 = 1 \rightarrow (x+4)^2 = 1 \rightarrow x+4 = \pm 1$



الف) $x^2 - 5x + 4 = 0 \rightarrow (x-1)(x-4) = 0 \rightarrow x = 1, 4$



ب) $x^2 - 5x - 14 = 0 \rightarrow (x-7)(x+2) = 0 \rightarrow x = 7, -2$



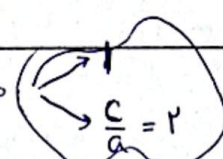
الف) $x^2 - 3x - 5 = 0 \rightarrow \frac{3 \pm \sqrt{9+20}}{2} = \frac{3 \pm \sqrt{29}}{2}$

$\Delta = 3^2 - 4(-5) = 29$

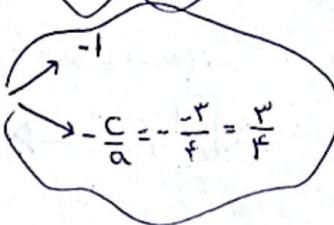
ب) $4x^2 - 4x + 1 = 0 \rightarrow \frac{1 \pm \sqrt{1-4}}{2} = \frac{1 \pm \sqrt{-3}}{2}$

$\Delta = (-4)^2 - 4(1)(4) = 16 - 16 = 0$

الف) $x^2 - 3x + 2 = 0 \rightarrow 1 + 2 - 3 = 0$

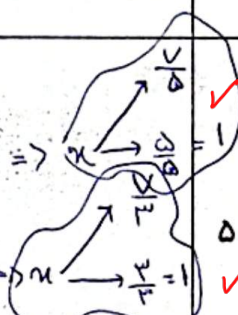


ب) $4x^2 + x - 3 = 0 \rightarrow 4 - 3 = 1$



الف) $x^2 - 12x + 35 = 0 \rightarrow x^2 - 12x + 36 = 0 \rightarrow (x-6)^2 = 0 \Rightarrow x = 6$

ب) $3x^2 - 10x + 3 = 0 \rightarrow x^2 - 10x + 11 = 0 \rightarrow (x-1)(x-11) = 0 \Rightarrow x = 1, 11$



الف) $-3m^2 + am - 1 = 0 \rightarrow \Delta = a^2 - 4(-1)(-3) = a^2 - 12 = 12 \Rightarrow$ ۲ ریشه دارد ✓

ب) $2m^2 - m + 2 = 0 \rightarrow \Delta = (-1)^2 - 4(2)(2) = 1 - 16 = -15 \Rightarrow$ ریشه ندارد ✓

ج) $2m^2 - am + 2 = 0 \rightarrow \Delta = (-a)^2 - 4(2)(2) = a^2 - 16 = 0 \Rightarrow$ درای ۲ ریشه مساوی یا ۱ ریشه مضرب دارد ✓

د) $2m^2 - m + 1 = 0 \rightarrow \Delta = (-1)^2 - 4(1)(2) = 1 - 8 = -7 \Rightarrow$ ریشه ندارد ✓ ۲

$2m^2 - 3m + a = 0$

الف) $\Delta > 0 \Rightarrow (-3)^2 - 4(a)(2) > 0 \rightarrow 9 - 8a > 0 \rightarrow 9 > 8a \rightarrow \frac{9}{8} > a$ ✓ ۲

ب) $\Delta = 0 \Rightarrow (-3)^2 - 4(a)(2) = 0 \rightarrow 9 - 8a = 0 \rightarrow 9 = 8a \rightarrow \frac{9}{8} = a$ ✓ ۲

ج) $\Delta < 0 \Rightarrow (-3)^2 - 4(a)(2) < 0 \rightarrow 9 - 8a < 0 \rightarrow 9 < 8a \rightarrow \frac{9}{8} < a$ ✓ ۲

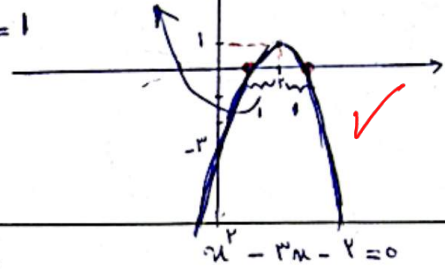
د) $\Delta \geq 0 \Rightarrow (-3)^2 - 4(a)(2) \geq 0 \rightarrow 9 - 8a \geq 0 \rightarrow 9 \geq 8a \rightarrow \frac{9}{8} \geq a$ ✓ ۲

الف) $y = m^2 + 4m + 5$
 عرفه از مبدأ $\rightarrow$ Min $\left| \begin{aligned} -\frac{b}{2a} &= -\frac{4}{2} = -2 \checkmark \\ y &= \frac{(-2)^2}{1} + 4(-2) + 5 = -4 \checkmark \end{aligned} \right.$ ۱۱۵

ب) $\sqrt{\Delta} = \sqrt{4^2 - 4(1)(5)} = \sqrt{16 - 20} = \sqrt{-4}$
 * رسم شکل با کمک نقطه استرس: $\frac{4}{2|a|} = \frac{4}{2|1|} = \frac{4}{2} = 2$

الف) $y = -m^2 + 4m - 3$
 عرفه از مبدأ $\rightarrow$ Max $\left| \begin{aligned} -\frac{b}{2a} &= -\frac{4}{-2} = 2 \checkmark \\ y &= -\frac{(2)^2}{1} + 4(2) - 3 = 1 \checkmark \end{aligned} \right.$ ۲

$\frac{\sqrt{\Delta}}{2|a|} = \frac{\sqrt{4^2 - 4(-1)(-3)}}{2|-1|} = \frac{\sqrt{16 - 12}}{2} = \frac{\sqrt{4}}{2} = 1 \rightarrow \frac{4}{2} = 2$
 $y = 0 \Rightarrow 0 = -m^2 + 4m - 3 \rightarrow 0 = m^2 - 4m + 3 \rightarrow (m-1)(m-3) = 0 \rightarrow m = 1, 3$ ✓



$y = 0 \Rightarrow$ چون برای محور m است نقطه دو نقطه $\Rightarrow (1, 0)$ و $(3, 0)$
 $\Rightarrow y - 1 = 1$
 $2 + 1 = 3$

$S = \alpha + \beta = -\frac{b}{a} \rightarrow -\frac{4}{-1} = 4$
 $P = \alpha \times \beta = \frac{c}{a} \rightarrow \frac{-3}{-1} = 3$

الف) $S^2 - 2P = (3)^2 - 2(1-2) \Rightarrow 9 + 2 = 11$ ✓ ۲

ب) $S^2 - 2P = (3)^2 - 2(3)(-2) \Rightarrow 9 + 12 = 21$ ✓