

الف) $x^2 - 4x + 1 = 0 \Rightarrow x^2 - 4x + 4 = 1 \Rightarrow (x-2)^2 = 1 \Rightarrow x-2 = \pm 1 \Rightarrow x = 3, x = 1$

ب) $x^2 + 12x + 17 = 0 \Rightarrow x^2 + 12x + 36 = 19 \Rightarrow (x+6)^2 = 19 \Rightarrow x+6 = \pm \sqrt{19} \Rightarrow x = -6 \pm \sqrt{19}$

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

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

الف) $x^2 - 3x - 4 = 0 \Rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(1)(-4)}}{2} = \frac{3 \pm \sqrt{9 + 16}}{2} = \frac{3 \pm 5}{2}$

$x = \frac{3+5}{2}, \frac{3-5}{2}$

ب) $2x^2 - 4x + \frac{1}{2} = 0 \Rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(2)(\frac{1}{2})}}{4} = \frac{4 \pm \sqrt{16 - 4}}{4} = \frac{4 \pm \sqrt{12}}{4}$

$x = \frac{4+\sqrt{12}}{4}, \frac{4-\sqrt{12}}{4}$

الف) $x^2 - 3x + 2 = 0 \Rightarrow 1 + (-3) + 2 = 0 \Rightarrow x = 1, x = \frac{c}{a} = 2$

ب) $4x^2 + x - 3 = 0 \Rightarrow x^2 + x - 12 = 0 \Rightarrow (x+4)(x-3) = 0 \Rightarrow x = -4, x = 3$

الف) $5x^2 - 12x + 7 = 0 \Rightarrow x^2 - 12x + 35 = 0 \Rightarrow P = 12, S = 35 \Rightarrow x = 5, x = 7$

ب) $3x^2 - 10x + 7 = 0 \Rightarrow x^2 - 10x + 21 = 0 \Rightarrow P = 10, S = 21 \Rightarrow x = 3, x = 7$

الف) $\Delta = b^2 - 4ac = \sqrt{25 - 4(-1)(-1)} = \sqrt{12} \xrightarrow{\Delta > 0} \text{اثنين حقيقي}$

ب) $\Delta = b^2 - 4ac = \sqrt{\frac{(-1)^2 - 4(2)(2)}{1}} = \sqrt{-15} \xrightarrow{\Delta < 0} \text{لا حقيقي}$

ج) $\Delta = b^2 - 4ac = 14 - 4(2)(2) = 0 \xrightarrow{\Delta = 0} \text{واحد حقيقي}$

د) $\Delta = b^2 - 4ac = 1 - \frac{4(2)(1)}{-1} = -7 \xrightarrow{\Delta < 0} \text{لا حقيقي}$

$2x^2 - 3x + a = 0 \Rightarrow \Delta = b^2 - 4ac = 9 - \frac{4 \times 2 \times a}{1 \times 2} \Rightarrow \Delta = 9 - 4a$

الف) $9 - 4a > 0 \Rightarrow 9 > 4a \Rightarrow \left\{ \frac{9}{4} > a \right\}$

ب) $9 - 4a = 0 \Rightarrow \left\{ a = \frac{9}{4} \right\}$

ج) $9 - 4a < 0 \Rightarrow 9 < 4a \Rightarrow \left\{ \frac{9}{4} < a \right\}$

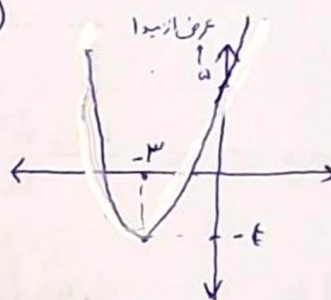
د) $9 - 4a \geq 0 \Rightarrow 9 \geq 4a \Rightarrow \left\{ \frac{9}{4} \geq a \right\}$

الف) $y = x^2 + 4x + 5 \rightarrow \textcircled{1} a > 0 \rightarrow \min$

$\textcircled{1} x = \frac{-b}{2a} = \frac{-4}{2} = -2, y = \frac{4 - (-16) + 5}{-2} = -5$

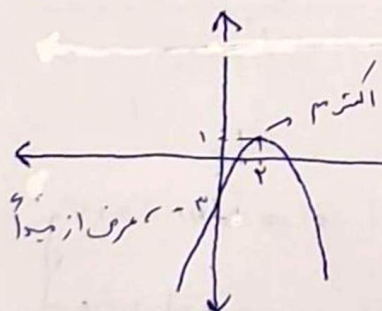
التركيب $\Rightarrow \min, \begin{vmatrix} -2 \\ -5 \end{vmatrix}$

ب)



الف) $y = -x^2 + 4x - 3 \rightarrow \textcircled{1} a < 0 \rightarrow \max, \textcircled{2} x = \frac{-b}{2a} = \frac{-4}{-2} = 2, y = -4 + 8 - 3 = 1$

التركيب $\Rightarrow \max, \begin{vmatrix} 2 \\ 1 \end{vmatrix}$



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

$x^2 - 3x - 2 = 0 \Rightarrow \begin{cases} p = 3 \\ s = -2 \end{cases}$
 $x^2 - 5x + 6 = 0$

الف) $(2)^2 - 2 \times 3 = 4 - 6 = -2$

ب) $(-2)^2 - 3 \frac{(-2)(3)}{-4} = -1 + 1.5 = +0.5$