

الف) $x^2 - 9x + 8 = 0 \xrightarrow{+1} x^2 - 9x + 9 = -1$

$\downarrow \quad \downarrow$
مربع x $2 \times x \times 3$

$(x-3)^2 = -1$

$(x-3) = \pm 1$

$\Rightarrow \begin{cases} x = 4 \\ x = 2 \end{cases}$

ب) $x^2 + 8x + 7 = 0 \xrightarrow{+9} x^2 + 8x + 14 = -9$

$\downarrow \quad \downarrow$
مربع x $2 \times x \times 4$

$(x+4)^2 = -9$

$(x+4) = \pm 3 \Rightarrow$

$\begin{cases} x = -1 \\ x = -7 \end{cases}$

الف) $x^2 - 5x + 6 = 0 \Rightarrow (x-3)(x-2) = 0$

$x = 3$

$x = 2$

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

$x = 7$

$x = -2$

الف) $x^2 - 3x - 5 = 0 \Rightarrow \frac{3 \pm \sqrt{9 - 4(-5)}}{2} \Rightarrow \begin{cases} x = 3 + \sqrt{29} \\ x = 3 - \sqrt{29} \end{cases}$

ب) $2x^2 - 4x + \frac{1}{2} = 0 \Rightarrow \frac{4 \pm \sqrt{16 - 4(2)(\frac{1}{2})}}{4} \Rightarrow \begin{cases} x = \frac{4 + \sqrt{14}}{4} \\ x = \frac{4 - \sqrt{14}}{4} \end{cases}$

1 - $a > 0$ (تواند اوج داشته باشد) $b^2 - 4ac > 0 \rightarrow 9 - 4a > 0$ (الف)

$9 - (4a) > 0$ $\rightarrow 9 - 4a > 0$ $\rightarrow 9 > 4a$ $\rightarrow a < \frac{9}{4}$ ✓

ب) $b^2 - 4ac = 0 \rightarrow 9 - 4a = 0$

$9 = 4a$

$a = \frac{9}{4}$ ✓

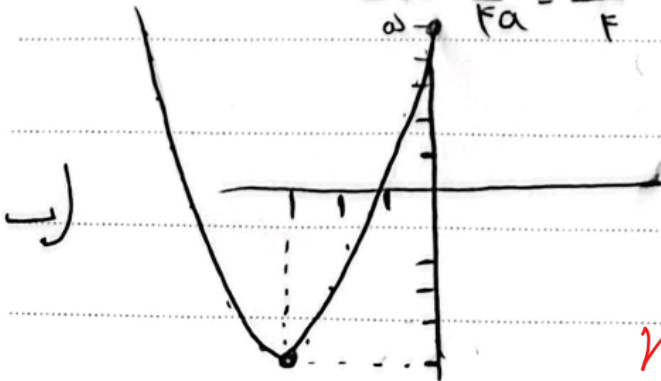
ج) $b^2 - 4ac < 0 \rightarrow 9 - 4a < 0$

$9 < 4a \rightarrow a > \frac{9}{4}$ ✓

د) $b^2 - 4ac \geq 0 \rightarrow 9 - 4a \geq 0 \rightarrow a \leq \frac{9}{4}$ ✓

$y = x^2 + 4x + a$

الف) $a > 0$ min $\begin{cases} x = -\frac{b}{2a} = -\frac{4}{2} = -2 \\ y = -\frac{b^2}{4a} = -\frac{16}{4} = -4 \end{cases} \rightarrow \begin{cases} -2 \\ -4 \end{cases}$ ✓



$$y = -x^2 + 4x - 3 \quad a < 0 \quad \max$$

الف) $\begin{cases} x = \frac{-b}{2a} = \frac{-4}{-2} = 2 \\ y = \frac{-\Delta}{4a} = \frac{-16 - (16)}{-4} = +1 \end{cases} \Rightarrow \begin{cases} 2 \\ +1 \end{cases}$

ب)

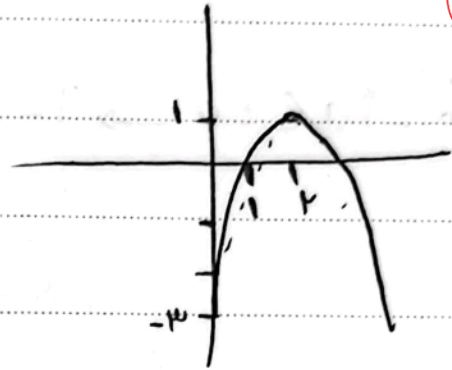
$$-x^2 + 4x - 3 \Rightarrow x^2 + 4x + 3$$

$$x = \frac{-1}{-1} = 1$$

دائرتان

$$(x+1)(x+3)$$

$$x = \frac{-3}{-1} = 3$$



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الف) $S^2 - 2P \Rightarrow 9 - 2(-2) = 13$

$$S = \frac{-b}{a} = \frac{4}{-1} = -4$$

$$P = \frac{c}{a} = \frac{-3}{-1} = 3$$

ب) $S^3 - 3SP \Rightarrow 27 - 3(-4)(3) = 27 + 36 = 63$

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