

الف) $x^2 - 6x + 8 = 0$ $x^2 - 6x + 9 - 9 + 8 = 0$ $(x-3)^2 - 1 + 8 = 0$ $(x-3)^2 - 1 = 0$ $(x-3)^2 = 1$ $x-3 = \pm 1$ $x = 3 \pm 1$ $x = 3+1=4$ و $x = 3-1=2$	ب) $x^2 + 11x + 10 = 0$ $x^2 + 11x + 10 = 1x + 10$ $(x+10)^2 - 100 + 10 = 0$ $(x+9)^2 - 81 + 10 = 0$ $(x+9)^2 - 71 = 0$ $(x+9)^2 = 71$ $x+9 = \pm \sqrt{71}$ $x = -9 \pm \sqrt{71}$	1
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الف) $x^2 - 8x + 15 = 0$ $x^2 - 8x + 16 - 16 + 15 = 0$ $(x-4)^2 - 1 = 0$ $(x-4)^2 = 1$ $x-4 = \pm 1$ $x = 4 \pm 1$ $x = 4+1=5$ و $x = 4-1=3$	ب) $x^2 - 5x + 4 = 0$ $x^2 - 5x + 4 = 1x + 4$ $(x+4)^2 - 16 + 4 = 0$ $(x+3)^2 - 9 + 4 = 0$ $(x+3)^2 - 5 = 0$ $(x+3)^2 = 5$ $x+3 = \pm \sqrt{5}$ $x = -3 \pm \sqrt{5}$	2
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الف) $x^2 - 3x - 5 = 0$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $x = \frac{3 \pm \sqrt{9 + 20}}{2}$ $x = \frac{3 \pm \sqrt{29}}{2}$	ب) $x^2 - 12x + 20 = 0$ $x^2 - 12x + 36 - 36 + 20 = 0$ $(x-6)^2 - 16 = 0$ $(x-6)^2 = 16$ $x-6 = \pm 4$ $x = 6 \pm 4$ $x = 6+4=10$ و $x = 6-4=2$	3
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الف) $x^2 - 3x + 2 = 0$ $x^2 - 3x + 2 = 1x + 2$ $(x+2)^2 - 4 + 2 = 0$ $(x+1)^2 - 1 = 0$ $(x+1)^2 = 1$ $x+1 = \pm 1$ $x = -1 \pm 1$ $x = -1+1=0$ و $x = -1-1=-2$	ب) $x^2 + x - 12 = 0$ $x^2 + x - 12 = 1x - 12$ $(x-12)^2 - 144 + 12 = 0$ $(x-11)^2 - 121 + 12 = 0$ $(x-11)^2 - 109 = 0$ $(x-11)^2 = 109$ $x-11 = \pm \sqrt{109}$ $x = 11 \pm \sqrt{109}$	4
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الف) $x^2 - 12x + 20 = 0$ $x^2 - 12x + 36 - 36 + 20 = 0$ $(x-6)^2 - 16 = 0$ $(x-6)^2 = 16$ $x-6 = \pm 4$ $x = 6 \pm 4$ $x = 6+4=10$ و $x = 6-4=2$	ب) $x^2 - 10x + 21 = 0$ $x^2 - 10x + 25 - 25 + 21 = 0$ $(x-5)^2 - 4 = 0$ $(x-5)^2 = 4$ $x-5 = \pm 2$ $x = 5 \pm 2$ $x = 5+2=7$ و $x = 5-2=3$	5
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الف) $3x^2 + 10x - 15 = 0$

$x = \frac{-10 \pm \sqrt{100 - 4 \cdot 3 \cdot (-15)}}{2 \cdot 3} = \frac{-10 \pm \sqrt{100 + 180}}{6} = \frac{-10 \pm \sqrt{280}}{6}$

ب) $2x^2 - 4x + 1 = 0$

$x = \frac{4 \pm \sqrt{16 - 8}}{4} = \frac{4 \pm \sqrt{8}}{4} = \frac{4 \pm 2\sqrt{2}}{4} = \frac{2 \pm \sqrt{2}}{2}$

ج) $2x^2 - 4x + 1 = 0$

$x = \frac{4 \pm \sqrt{16 - 8}}{4} = \frac{4 \pm \sqrt{8}}{4} = \frac{4 \pm 2\sqrt{2}}{4} = \frac{2 \pm \sqrt{2}}{2}$

الف) $\Delta > 0 \Rightarrow$ جذرين حقيقيين مختلفين

$\Delta = (-2)^2 - 4 \cdot 1 \cdot a = 4 - 4a$

$4 - 4a > 0 \Rightarrow 4 > 4a \Rightarrow 1 > a \Rightarrow a < 1$

ب) $\Delta < 0$ لا جذرين حقيقيين

$\Delta = 4 - 4a < 0 \Rightarrow 4 < 4a \Rightarrow 1 < a$

الف) $y = x^2 + 2x + 8$

$\Delta = 4 - 4 \cdot 1 \cdot 8 = 4 - 32 = -28 < 0$

ب) $y = x^2 + 2x + 8$

$\Delta = 4 - 4 \cdot 1 \cdot 8 = 4 - 32 = -28 < 0$

الف) $y = x^2 + 4x - 3$

$\Delta = 16 - 4 \cdot 1 \cdot (-3) = 16 + 12 = 28 > 0$

ب) $y = x^2 + 4x - 3$

$\Delta = 16 - 4 \cdot 1 \cdot (-3) = 16 + 12 = 28 > 0$

الف) $x^2 - 3x + 2 = 0$

$x = \frac{3 \pm \sqrt{9 - 8}}{2} = \frac{3 \pm 1}{2}$

ب) $x^2 - 3x + 2 = 0$

$x = \frac{3 \pm \sqrt{9 - 8}}{2} = \frac{3 \pm 1}{2}$