

الف)  $x^2 - 4x + 4 = 0 \xrightarrow{+1} x^2 - 4x + 5 = 1 \rightarrow (x-2)^2 = 1$  ✓  
 $x-2 = \pm 1 \rightarrow x = 3, x = 1$

ب)  $x^2 + 8x + 15 = 0 \xrightarrow{+9} x^2 + 8x + 24 = 9 \rightarrow (x+4)^2 = 9$  ✓  
 $x+4 = \pm 3 \rightarrow x = -7, x = -1$

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الف)  $x^2 - 5x + 4 = 0 \rightarrow (x-3)(x-2) = 0 \rightarrow x = 3, x = 2$  ✓

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

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الف)  $x^2 - 3x - 2 = 0 \rightarrow x = \frac{3 \pm \sqrt{9+8}}{2} \Rightarrow x = \frac{3 \pm \sqrt{17}}{2}$  ✓

$\frac{-b \pm \sqrt{\Delta}}{2a}$

ب)  $2x^2 - 4x + 1 = 0 \rightarrow x = \frac{4 \pm \sqrt{16-8}}{4} \Rightarrow x = \frac{2 \pm \sqrt{2}}{2} \Rightarrow x = 1 \pm \sqrt{2}$  ✓

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

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

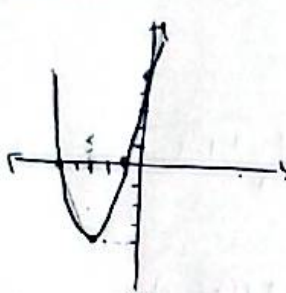
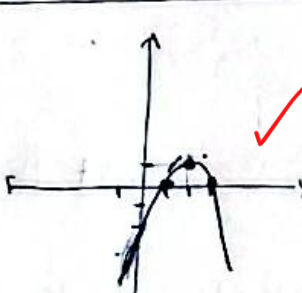
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الف)  $x^2 - 12x + 27 = 0 \rightarrow x^2 - 12x + 36 = 9 \rightarrow (x-6)^2 = 9 \rightarrow x = 9, x = 3$  ✓

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ب)  $x^2 - 10x + 21 = 0 \rightarrow x^2 - 10x + 21 = 0 \rightarrow (x-7)(x-3) = 0 \rightarrow x = 7, x = 3$  ✓

۲ ریشه دارد

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| <p>الف) <math>-3x^2 + ax - 1 = 0 \rightarrow x = \frac{-a \pm \sqrt{a^2 - 12}}{-6} \rightarrow x = \frac{+a + \sqrt{12}}{+6}, x = \frac{+a - \sqrt{12}}{+6}</math></p> <p>ب) <math>2x^2 - x + 2 = 0 \rightarrow \Delta = 1 - 4 &lt; 0</math> ریشه ندارد</p> <p>ج) <math>2x^2 - 4x + 2 = 0 \rightarrow \Delta = 16 - 16 = 0</math> یک ریشه مضرب</p> <p>د) <math>2x^2 - x + 1 = 0 \rightarrow \Delta = 1 - 8 &lt; 0</math> ریشه ندارد</p>                          | <p>۱.۵</p> |
| <p><math>2x^2 - 3x + a = 0</math></p> <p>الف) <math>\Delta &gt; 0 \rightarrow \Delta = 9 - 8a &gt; 0 \rightarrow a &lt; \frac{9}{8}</math> ✓</p> <p>ب) <math>\Delta = 0 \rightarrow \Delta = 9 - 8a = 0 \rightarrow a = \frac{9}{8}</math> ✓</p> <p>ج) <math>\Delta &lt; 0 \rightarrow \Delta = 9 - 8a &lt; 0 \rightarrow a &gt; \frac{9}{8}</math> ✓</p> <p>د) <math>\Delta \geq 0 \rightarrow a \leq \frac{9}{8}</math> ✓</p>                                  | <p>۲</p>   |
| <p><math>y = x^2 + 4x + a</math></p> <p><math>\min \left/ \begin{array}{l} \frac{-b}{2a} = -2 \\ \frac{-\Delta}{4a} = -4 \end{array} \right. \checkmark</math></p>  <p><math>x = 0 \rightarrow y = a</math><br/> <math>y = 0 \rightarrow x = -a, x = -1</math></p>                                                                                                             | <p>۲</p>   |
| <p><math>y = x^2 + 4x - 3</math></p> <p><math>\max \left/ \begin{array}{l} \frac{-b}{2a} = 2 \\ \frac{-\Delta}{4a} = 1 \end{array} \right. \checkmark</math></p>  <p><math>x = 0 \rightarrow y = -3</math><br/> <math>y = 0 \rightarrow x = 1, x = 3</math></p> <p>ب) <math>-(x^2 - 4x + 3) = 0</math><br/> <math>-(x-1)(x-3) = 0</math><br/> <math>x = 1, x = 3</math> ✓</p> | <p>۹</p>   |
| <p><math>x^2 - 3x - 2 = 0</math></p> <p>الف) <math>S^2 - 2P = 9 + 4 = 13</math> ✓</p> <p>ب) <math>S^3 - 3SP = 27 + 12 = 39</math> ✓</p>                                                                                                                                                                                                                                                                                                                          | <p>۱.۵</p> |