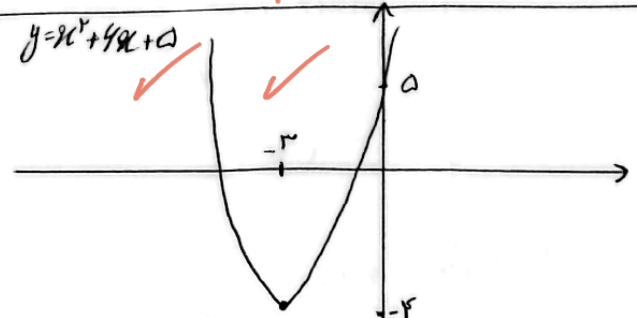


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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| <p>الف) <math>\min \begin{cases} -3 \\ -2 \end{cases}</math></p> <p><math>y = x^2 + 4x + 5</math></p> <p><math>y = x^2 + 4x + 5</math></p>                                                                                                                                                                                                                                      | <p>ب)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <p>۱</p> |
| <p>الف) <math>\max x \begin{cases} 2 \\ 1 \end{cases}</math></p> <p><math>y = -x^2 + 2x - 3</math></p>                                                                                                                                                                                         | <p>ب)</p> <p><math>y = 0 \Rightarrow -x^2 + 2x - 3 = 0</math></p> <p><math>a + b + c = 0 \Rightarrow \begin{cases} x = 3 \\ x = 1 \end{cases}</math></p> <p>فقط: <math>\begin{cases} 1 \\ 1 \end{cases}</math></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>۲</p> |
| <p>الف) <math>2x^2 - 2x + a = 0</math></p> <p><math>a + b + c = 0 \Rightarrow \begin{cases} x = \frac{1}{2} \\ x = 1 \end{cases}</math></p> <p><math>a = 1</math></p> <p><math>a &lt; \frac{9}{4}</math></p>                                                                                                                                                                    | <p>الف) <math>\Delta = 0</math></p> <p><math>\Delta = b^2 - 4ac</math></p> <p><math>0 = 4 - 4a</math></p> <p><math>1a = 1</math></p> <p><math>a = \frac{9}{4}</math></p> <p>ب) <math>\Delta &lt; 0</math></p> <p><math>4 - 4a &lt; 0</math></p> <p><math>1a &gt; 1</math></p> <p><math>a &gt; \frac{9}{4}</math></p> <p><math>a = 2</math></p> <p>ج) <math>\Delta &gt; 0</math></p> <p><math>4 - 4a &gt; 0</math></p> <p><math>1a &lt; 1</math></p> <p><math>a &lt; \frac{9}{4}</math></p> <p><math>a = \frac{1}{2}</math></p> <p>نشان دهنده است که این معادله دو جواب دارد و این دو جواب از آنجا که مجموع آنها صفر است و حاصلضرب آنها منفی است، پس یکی مثبت و دیگری منفی است.</p> | <p>۳</p> |
| <p>الف) <math>x^2 - 2x - 1 = 0</math></p> <p><math>x^2 - 2x + 1 - 2 = 0 \Rightarrow (x - 1)^2 = 2 \Rightarrow x - 1 = \pm \sqrt{2}</math></p> <p><math>\Rightarrow \begin{cases} x = 1 + \sqrt{2} \\ x = 1 - \sqrt{2} \end{cases}</math></p>                                                                                                                                    | <p>ب) <math>x^2 - x - 1 = 0</math></p> <p><math>x^2 - x + \frac{1}{4} - \frac{5}{4} = 0</math></p> <p><math>(x - \frac{1}{2})^2 = \frac{5}{4} \Rightarrow x - \frac{1}{2} = \pm \frac{\sqrt{5}}{2}</math></p> <p><math>\begin{cases} x = \frac{1 + \sqrt{5}}{2} \\ x = \frac{1 - \sqrt{5}}{2} \end{cases}</math></p>                                                                                                                                                                                                                                                                                                                                                               | <p>۴</p> |
| <p>الف) <math>x^2 - 2x - 1 = 0</math></p> <p><math>\Delta = b^2 - 4ac = 4 + 4 = 8</math></p> <p><math>x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{2 \pm \sqrt{8}}{2} = \frac{2 \pm 2\sqrt{2}}{2} = 1 \pm \sqrt{2}</math></p> <p><math>\Rightarrow \begin{cases} x = \frac{2 + 2\sqrt{2}}{2} = 1 + \sqrt{2} \\ x = \frac{2 - 2\sqrt{2}}{2} = 1 - \sqrt{2} \end{cases}</math></p> | <p>ب) <math>x^2 + 8x - 4 = 0</math></p> <p><math>\Delta = b^2 - 4ac = 64 + 16 = 80</math></p> <p><math>x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-8 \pm \sqrt{80}}{2} = \frac{-8 \pm 4\sqrt{5}}{2} = -4 \pm 2\sqrt{5}</math></p> <p><math>\Rightarrow \begin{cases} x = \frac{-8 + 4\sqrt{5}}{2} = -4 + 2\sqrt{5} \\ x = \frac{-8 - 4\sqrt{5}}{2} = -4 - 2\sqrt{5} \end{cases}</math></p>                                                                                                                                                                                                                                                                                        | <p>۵</p> |

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| <p>الف) <math>x^2 - 11x + 28 = 0</math></p> <p><math>(x-7)(x-4) = 0</math></p> <p><math>\begin{cases} x=7 \\ x=4 \end{cases}</math></p>                                                                                                                                                                                                                                                                                            | <p>ب) <math>x^2 + 2x - 28 = 0</math></p> <p><math>(x-4)(x+7) = 0</math></p> <p><math>\begin{cases} x=-7 \\ x=4 \end{cases}</math></p>                                                                            | 6<br>2 |         |
| <p>الف) <math>\Delta x^2 - 12x + 7 = 0</math></p> <p><math>x^2 - 12x + 36 = 0 \Rightarrow (x-6)(x-6) = 0</math></p> <p><math>\begin{cases} x = \frac{12}{2} = 6 \\ x = \frac{36}{6} = 6 \end{cases}</math></p>                                                                                                                                                                                                                     | <p>ب) <math>3x^2 - 10x + 7 = 0</math></p> <p><math>x^2 - 10x + 21 = 0 \Rightarrow (x-7)(x-3) = 0</math></p> <p><math>\begin{cases} x = \frac{10}{3} = 3\frac{1}{3} \\ x = \frac{7}{1} = 7 \end{cases}</math></p> | 7<br>2 |         |
| <p>الف) <math>2x^2 - 2x + 3 = 0</math></p> <p><math>a+b+c=0 \Rightarrow \begin{cases} x = \frac{1}{2} \\ x = 1 \end{cases}</math></p>                                                                                                                                                                                                                                                                                              | <p>ب) <math>3x^2 + 4x + 3 = 0</math></p> <p><math>a+c=b \Rightarrow \begin{cases} x = -\frac{3}{2} \\ x = -1 \end{cases}</math></p>                                                                              |        |         |
| <p>ج) <math>2x^2 - 2x + 1 = 0</math></p> <p><math>\Delta = b^2 - 4ac = 17</math></p> <p><math>x = \frac{-b \pm \sqrt{\Delta}}{2a}</math></p> <p><math>x = \frac{2 \pm \sqrt{17}}{4} \Rightarrow \begin{cases} x = \frac{2 - \sqrt{17}}{4} \\ x = \frac{2 + \sqrt{17}}{4} \end{cases}</math></p>                                                                                                                                    | <p>د) <math>4x^2 + 7x + 9 = 0</math></p> <p><math>\Delta = b^2 - 4ac = 49 - 144 = -95</math></p> <p>چون دلتا منفي است<br/>پس جواب ندارد</p>                                                                      | 8<br>2 |         |
| <p><math>x^2 - 2x - 2 = 0</math></p> <p>الف) <math>S^2 - 2P = 2^2 - (-2) = 10</math></p> <p><math>S = -\frac{b}{a} = 2</math></p> <p><math>P = \frac{c}{a} = -2</math></p> <p>ب) <math>S^3 - 3SP = 2^3 - 3(2)(-2) = 8 + 12 = 20</math></p>                                                                                                                                                                                         |                                                                                                                                                                                                                  |        | 9<br>2  |
| <p>الف) <math>\binom{9}{0} + \binom{9}{2} = \frac{9!}{0! \times 9!} + \frac{9!}{2! \times 7!} = \frac{9 \times 8 \times 7!}{2 \times 7!} + \frac{9 \times 8 \times 7!}{2 \times 7!} = 1 + 36 = 37</math></p> <p>ب) <math>\binom{9}{3} - \binom{9}{2} = \frac{9!}{3! \times 6!} - \frac{9!}{2! \times 7!} = \frac{9 \times 8 \times 7 \times 6!}{6 \times 6!} - \frac{9 \times 8 \times 7!}{2 \times 7!} = 12 - 36 = -24</math></p> |                                                                                                                                                                                                                  |        | 10<br>2 |