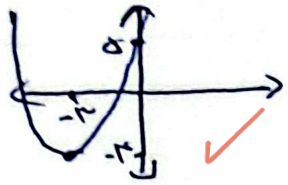
نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ...۱... کلاس .....

۱

$y = x^2 + 4x + 5$ Min $\left| \frac{-b}{2a} = -2 \right.$

$\frac{-\Delta}{4a} = \frac{-b^2+4ac}{4a} = \frac{-16+20}{4} = -1$



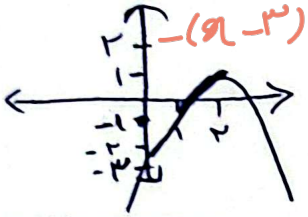
۲

$y = -x^2 + 4x - 3$ Max $\left| \frac{-b}{2a} = \frac{-4}{-2} = 2 \right.$

$\frac{-\Delta}{4a} = \frac{-b^2+4ac}{4a} = \frac{-16+12}{-4} = 1$

$-(x^2-4x+3) \geq 0$

$-(x-3)(x-1) \geq 0$



$1 \leq x \leq 3$

بیشتر یا کمتر؟

$\Delta > 0 \leftarrow b^2 - 4ac > 0$

۳

الف) $2x^2 - 4x + a = 0 \rightarrow 2x^2 - 3x + 4 = 0$

$\Delta < 0 \rightarrow 9a - 1 < 0 \rightarrow a < \frac{1}{9}$

$4x^2 - 4x + 1 = 0 \rightarrow (2x-1)^2 = 0 \rightarrow x = \frac{1}{2}$

ب) $2x^2 - 3x + a = 0 \rightarrow 2x^2 - 3x + 1.25 = 0$

$\Delta = 0 \rightarrow b^2 - 4ac \rightarrow (-3)^2 - 8c = 0 \Rightarrow 8c = 9 \Rightarrow c = 1.125$

$b^2 - 4ac < 0$

ج) $\Delta < 0 \rightarrow a > 1.125$

$\Delta = 0 \rightarrow a = 1.125$

$\Delta > 0 \rightarrow a < 1.125$

۴

الف) $x^2 - 2x - 1 = 0 \rightarrow x^2 - 2x = 1$

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

$\Rightarrow x - 1 = \pm\sqrt{2}$

$\Rightarrow x = \pm\sqrt{2} + 1$

$x_1 = \sqrt{2} + 1$

$x_2 = 1 - \sqrt{2}$

ب) $x^2 - x - 1 = 0$

$x^2 - x = 1$

$(x - \frac{1}{2})^2 = x^2 - x + \frac{1}{4} = 1 + \frac{1}{4} = \frac{5}{4}$

$x - \frac{1}{2} = \pm\frac{\sqrt{5}}{2}$

$x = \pm\frac{\sqrt{5}}{2} + \frac{1}{2}$

$x_1 = \frac{\sqrt{5}+1}{2}$ $x_2 = \frac{1-\sqrt{5}}{2}$

۵

الف) $x^2 - 2x - 1 = 0$

$x_1 = \frac{-b+\sqrt{b^2-4ac}}{2a} = \frac{2+\sqrt{4-(-4)}}{2} = \frac{2+\sqrt{8}}{2} = \frac{\sqrt{2}+1}{2}$

$x_2 = \frac{2-\sqrt{8}}{2} = 1 - \frac{\sqrt{8}}{2}$

ب) $x^2 + x - 4 = 0$

$x_1 = \frac{-b+\sqrt{b^2-4ac}}{2a} = \frac{-1+\sqrt{1-(-16)}}{2} = \frac{-1+\sqrt{17}}{2}$

$= -\frac{1}{2} + \frac{\sqrt{17}}{2}$

$x_2 = \frac{-1}{2} - \frac{\sqrt{17}}{2}$

۶

الف) $x^2-11x+28=0 \Rightarrow (x-4)(x-7)=0 \to x_1=4$ و $x_2=7$

ب) $x^2+3x-28=0 = (x+7)(x-4)=0 \to x_1=-7$ و $x_2=4$

۷

الف) $5x^2-12x+7=0 \to x^2-12x+35=0=(x-5)(x-7)=0$

$\Rightarrow x_1=5 \to \frac{5}{5}=1$

و $x_2=7 \to \frac{7}{5}=1.4$

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

$x_1=7 \to \frac{7}{3}$ و $x_2=3 \to \frac{3}{3}=1$

۸

الف) $2x^2-5x+3=0$ مجموع ضرایب صفر ⇐ $x_1=1$ و $x_2=\frac{c}{a}=\frac{3}{2}=1.5$

ب) $2x^2+5x+3=0 \to a+c=b$ ⇐ $x_1=-1$ و $x_2=-\frac{c}{a}=-\frac{3}{2}=-1.5$

ج) $2x^2-5x+1=0$

$x_1=\frac{-b+\sqrt{b^2-4ac}}{2a}=\frac{5+\sqrt{25-8}}{4}=\frac{5+\sqrt{17}}{4}$

$x_2=\frac{5}{4}-\frac{\sqrt{17}}{4}$

د) $4x^2+7x+9=0$ $x_1=\frac{-b\pm\sqrt{b^2-4ac}}{2a}=\frac{-7\pm\sqrt{49-144}}{8} \to \Delta<0$ ریشه حقیقی ندارد

۹

الف) $S^2-2P=(\frac{-b}{a})^2-2(\frac{c}{a})=9-(-4)=13$ ؛ $x^2-3x-2=0$

ب) $S^3-3SP=(\frac{-b}{a})^3-3(\frac{-b}{a}\times\frac{c}{a})=\frac{(-b)^3}{a^3}-3(\frac{-bc}{a^2})=27-3(\ldots)=27+18=45$

۱۰

الف) $\binom{7}{5}+\binom{9}{2}=\frac{7!}{5!\times2!}+\frac{9!}{2!\times7!}=\frac{7\times6}{2\times1}+\frac{9\times8}{2}=21+36=57$

ب) $\binom{9}{3}-\binom{8}{2}=\frac{9!}{3!\times6!}-\frac{8!}{2!\times6!}=\frac{9\times8\times7}{3\times2\times1}-\frac{8\times7}{2}=84-28=56$