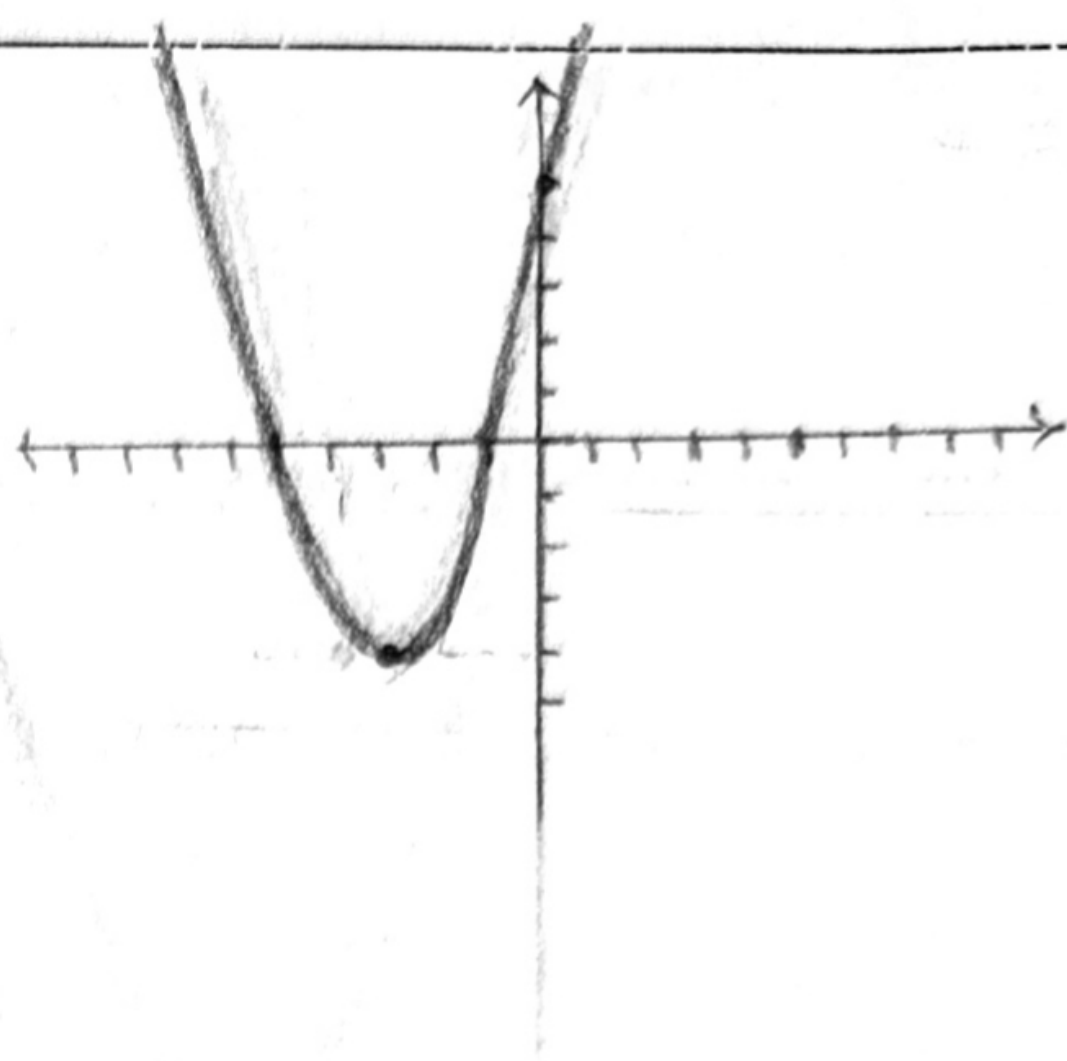


$$y = x^2 + 4x + 5$$

$$a > 0 \rightarrow U \rightarrow \min$$

$$\min \begin{cases} \frac{-b}{2a} = \frac{-4}{2} = -2 \\ \frac{-\Delta}{4a} = \frac{-(b^2 - 4ac)}{4} = \frac{-(16 - 20)}{4} = \frac{-(-4)}{4} = 1 \end{cases}$$

$$y_{\min} = 1$$



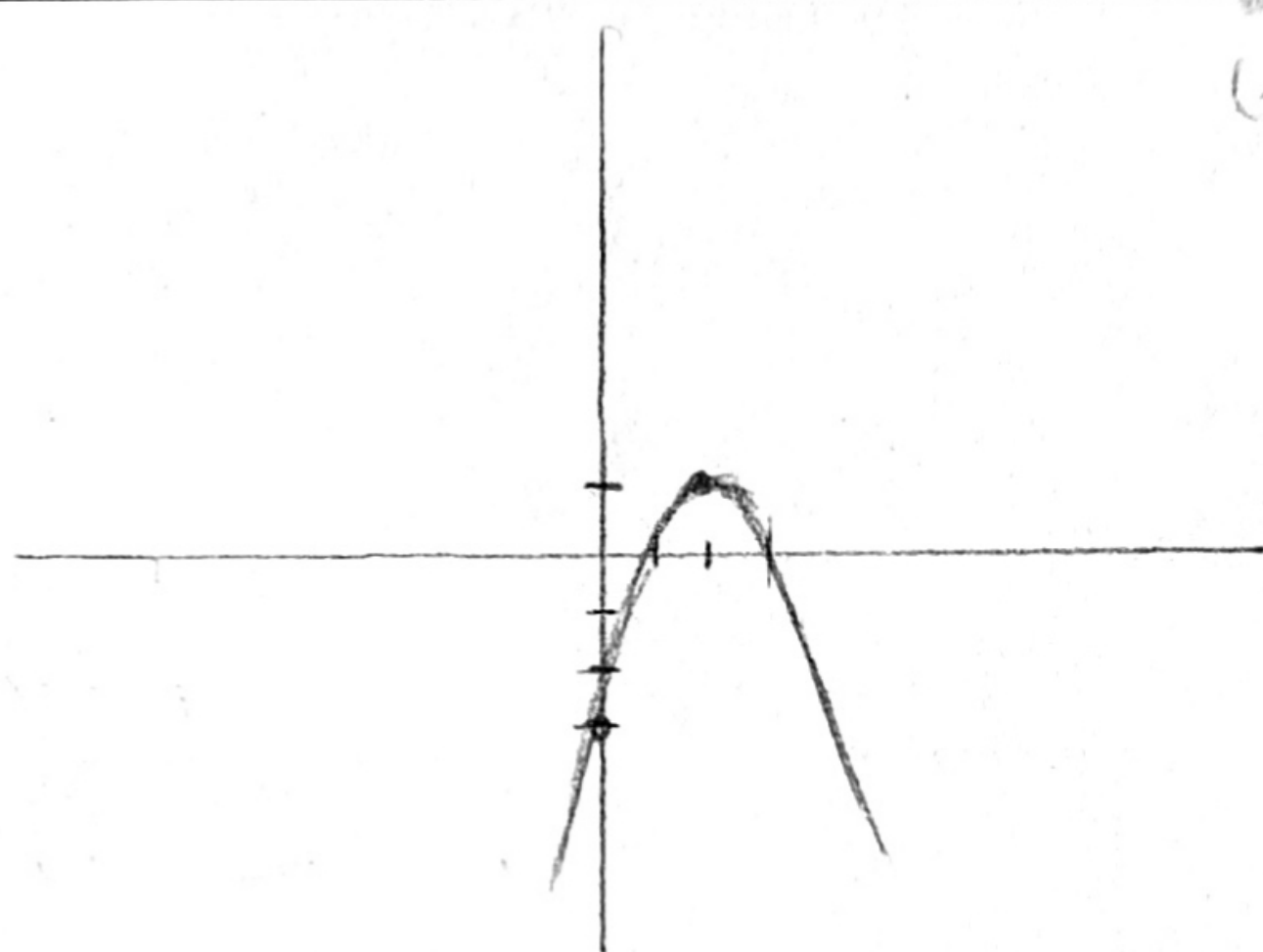
$$y = -x^2 + 4x - 3$$

$$a < 0 \rightarrow \cap \rightarrow \max$$

$$x = \frac{-b}{2a} = \frac{-4}{-2} = 2$$

$$y = (-1) \times 4 + 16 - 3 = 1$$

$$y_{\max} = 1$$



$$(-1)(0) \rightarrow -x^2 + 4x - 3 = 0$$

$$x^2 - 4x + 3 = 0$$

$$(x-1)(x-3) = 0$$

$$x = 1 \quad x = 3$$

$$(1, 0), (3, 0)$$

در این نقاط محور را قطع میکند

$$2x^2 - 3x + a = 0$$

$$1) \Delta = b^2 - 4ac = (-3)^2 - 4(2)(a) = 9 - 8a \rightarrow \Delta > 0 \Rightarrow 9 - 8a > 0 \Rightarrow a < \frac{9}{8}$$

$$2) \Delta = 0 \rightarrow 9 - 8a = 0 \rightarrow 9 = 8a \rightarrow a = \frac{9}{8}$$

$$3) \Delta < 0 \rightarrow 9 - 8a < 0 \rightarrow -8a < -9 \rightarrow a > \frac{9}{8}$$

$$4) \Delta \geq 0 \rightarrow 9 - 8a \geq 0 \rightarrow -8a \geq -9 \rightarrow a \leq \frac{9}{8}$$

$$الف) x^2 - 2x - 1 = 0 \rightarrow \left(\frac{-2}{1}\right)^2 = 1$$

$$1 + x^2 - 2x = 1 + 1 \rightarrow x^2 - 2x + 1 = 2 \rightarrow (x-1)^2 = 2 \rightarrow x-1 = \pm\sqrt{2} \rightarrow x = 1 \pm \sqrt{2} \quad x_1 = 1 + \sqrt{2} \quad x_2 = 1 - \sqrt{2}$$

$$ب) x^2 - x - 1 = 0 \rightarrow \left(\frac{-1}{1}\right)^2 = \frac{1}{1}$$

$$\frac{1}{1} + x^2 - x = 1 + \frac{1}{1}$$

$$(x - \frac{1}{2})^2 = \frac{\Delta}{1}$$

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

$$x_1 = \frac{1}{2} + \sqrt{\frac{\Delta}{1}}$$

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

$$الف) x^2 - 2x - 1 = 0$$

$$x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-(-2) \pm \sqrt{4}}{2} = \frac{2 \pm 2}{2} = \frac{2 \pm 2\sqrt{1}}{2} = 1 \pm \sqrt{1} \rightarrow x_1 = 1 + \sqrt{1} \quad x_2 = 1 - \sqrt{1}$$

$$\Delta = b^2 - 4ac = 4 - (-4) = 8$$

$$ب) x^2 + x - 4 = 0$$

$$x = \frac{-1 \pm \sqrt{17}}{2}$$

$$x_1 = \frac{-1 + \sqrt{17}}{2}$$

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

$$\Delta = b^2 - 4ac = 1 - (-16) = 17$$

$-r-v \quad (-r, -v)$ ا) $x^2 - 11x + 18 = 0$ $(x-4)(x-3) \rightarrow x=4 \quad x=3$ $v-r \quad (+v, -r)$ ب) $x^2 + 12x - 18 = 0$ $(x+18)(x-1) \rightarrow x=-18 \quad x=1$	9
ا) $\Delta x^2 - 12x + 18 = 0$ $x^2 - 12x + 18 = 0$ $(x-6)(x-3) = 0 \rightarrow x = \frac{\Delta}{2} = 1 \quad x = \frac{v}{\Delta}$ ب) $12x^2 - 10x + 1 = 0$ $x^2 - 10x + 12 = 0$ $(x-12)(x-1) = 0 \rightarrow x = \frac{12}{1} = 12, x = \frac{1}{12}$	7
ا) $rx^2 - ax + r = 0$ $a+b+c=0 \quad x=1 \quad x = \frac{c}{a} = \frac{r}{r}$ ب) $rx^2 + ax + r = 0$ $a+c=b \quad x=-1 \quad x = -\frac{c}{a} = -\frac{r}{r}$ ج) $rx^2 - ax + 1 = 0 \quad \Delta = b^2 - 4ac = (-a)^2 - 4 = 1a^2 - 4 = 1v$ $x = \frac{a \pm \sqrt{1v}}{r} \rightarrow x_1 = \frac{a + \sqrt{1v}}{r}, x_2 = \frac{a - \sqrt{1v}}{r}$ د) $rx^2 + vx + 9 = 0 \quad \Delta = b^2 - 4ac = 1v^2 - 36 = -9 < 0$ (لا يوجد حلا حقيقي)	1
$x^2 - rx - r = 0$ $S = \frac{-b}{a} = \frac{-(-r)}{1} = r$ $P = \frac{c}{a} = -r$ $S^2 - rP = 9 - (-r) = 1r$ $S^2 - rSP = 1v - (-1r) = 1r$	9
ا) $\begin{pmatrix} v \\ a \end{pmatrix} + \begin{pmatrix} 9 \\ r \end{pmatrix} \Rightarrow v \times 9 + \frac{9 \times r}{r} = 1r + 1r = 2r$ ب) $\begin{pmatrix} 9 \\ r \end{pmatrix} - \begin{pmatrix} 1 \\ r \end{pmatrix} \Rightarrow \frac{1r \times r}{r \times r} - \frac{1r \times v}{r} = 1r - 1v = 2v$	10