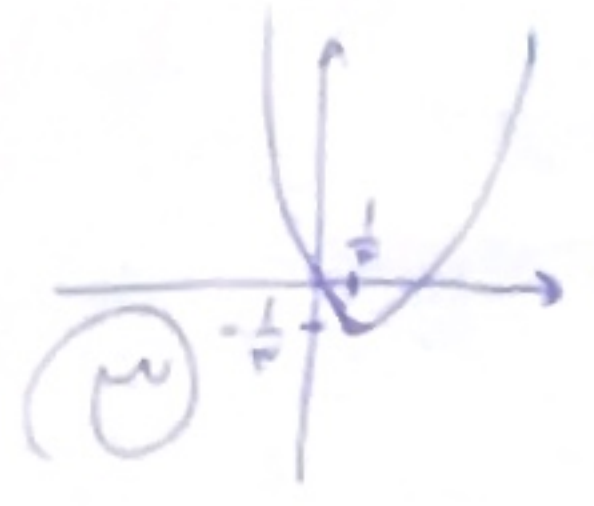


$$y = 3x^2 - 2x + 0 \quad x_v = \frac{-b}{2a} = \frac{2}{6} = \frac{1}{3}$$

$$y_v = \frac{-\Delta}{4a} = \frac{-(b^2 - 4ac)}{12} = \frac{-4 + 4(3)(0)}{12} = -\frac{1}{3}$$

(الف)

$a > 0$



$$S\left(\frac{1}{3}, -\frac{1}{3}\right)$$

~~از ناحیه سوم~~

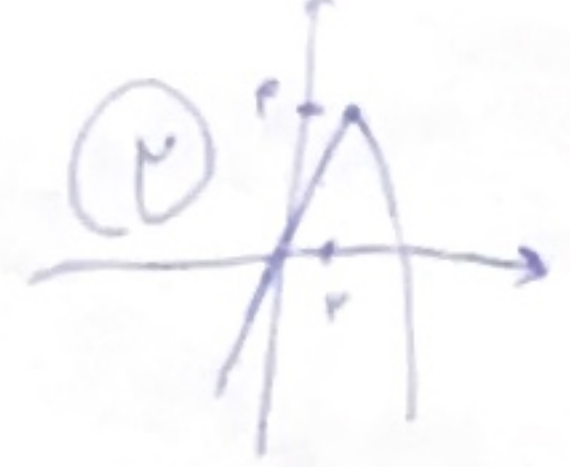
از ناحیه سوم

$$y = -x^2 + 2x + 0 \quad x_v = \frac{-b}{2a} = \frac{-2}{-2} = 1$$

$$y_v = \frac{-b^2 + 4ac}{-4} = \frac{-(16 - 4(1)(0))}{-4} = 4$$

(ب)

$a < 0$



$$S(1, 4)$$

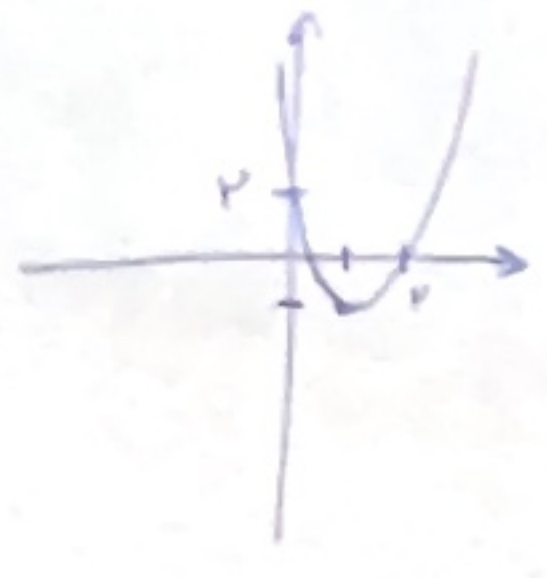
ناحیه دوم

$$y = 2x^2 - dx + 2 \quad x_v = \frac{d}{4}$$

$$y_v = \frac{-(b^2 - 4ac)}{4a} = \frac{-(d^2 - 4(2)(2))}{4} = -\frac{d}{4}$$

(الف)

$a > 0$



$$S\left(\frac{d}{4}, -\frac{d}{4}\right)$$

$$\Delta = 9$$

$$\frac{-b \pm \sqrt{\Delta}}{2a} = \frac{d \pm 3}{4}$$

$x < 2$
 $x = \frac{1}{2}$

ناحیه اول و دوم
ناحیه اول، دوم، و سوم

$$y = -x^2 + 2x - 1$$

$$x_v = \frac{-b}{2a} = \frac{-2}{-2} = 1$$

$$y_v = \frac{-(b^2 - 4ac)}{4a} = \frac{-(16 - 4(1)(1))}{-4} = 3$$

(ب)

$a < 0$



$$S(1, 3)$$

$$P = \frac{c}{a} = \frac{-1}{-1} = +1 > 0$$

ناحیه اول، دوم، و سوم

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

$$S = \alpha + \beta = 1$$

$$\alpha - \beta = \frac{\sqrt{\Delta}}{|a|} = \frac{\sqrt{1 - 4(-1)(3)}}{1} = \sqrt{13}$$

$$\frac{\alpha + \beta}{\alpha - \beta} = \frac{1}{\sqrt{13}}$$

$$P = -3$$

(ب)

$$\alpha^2 + \beta^2 = S^2 - 2P = 1^2 - 2(-3) = 1 + 6 = 7$$

$$\alpha^3 + \beta^3 = S^3 - 3PS = 1^3 - 3(1)(-3) = 1 + 9 = 10$$

(ج)

$$\alpha^3 - \beta^3 = (\alpha - \beta)(\alpha^2 + \alpha\beta + \beta^2) = \sqrt{13} \times 4 = 4\sqrt{13}$$

(د)

$$(\alpha + \beta)^2 = \alpha^2 + \beta^2 + 2\alpha\beta \Rightarrow \alpha^2 + \beta^2 = 1 - (-6) = 7$$

$$\Delta = a^2 - 4a = 0 \Rightarrow a(a - 4) = 0$$

$$x = 2 \quad \boxed{x=2}$$

$$a = 4 \quad \boxed{a=4}$$

$$a = 0$$

$$x^2 - ax + a \rightarrow 2 - 2a + a = 0$$

$$2 - a = 0 \Rightarrow a = 2 \quad \boxed{a=2}$$

(ه)

$$\alpha + \beta = r$$

$$\alpha\beta = \frac{-a}{r}$$

$$\alpha^r = (\alpha + \beta)\alpha - \alpha\beta$$

$$\alpha^r = r\alpha - \alpha\beta$$

$$\beta = r - \alpha$$

$$\beta^r = r\alpha - \alpha\beta$$

$$\frac{r\alpha^r - r\alpha + a}{r} = 0$$

$$(\alpha - 1)(\alpha - r) = 0$$

$\alpha = 1$
 $\alpha = r$

$$r(r^r) - r(r) - a = 0$$

$$a = -9$$

$$A(r\alpha + r, \alpha - r) \quad B(r - \alpha, \alpha - r)$$

$$S(b, b - r)$$

$$b = \frac{(r\alpha + r) + r - \alpha}{r} = \frac{10}{r} = d$$

$$S(d, r)$$

$$\begin{cases} x = 0 \\ y = -r \end{cases}$$

für 1. Job

$$\sqrt{0^2 + (-r)^2} = r$$

$$ax^r - ax - b = 0$$

$$\alpha + \beta = 1 \quad \alpha\beta = \frac{-b}{a}$$

$$r\alpha\beta^r + r\alpha\alpha^r - r\alpha\beta = 1/r$$

$$\Rightarrow r\beta^r + \alpha^r - \beta = \frac{1/r}{r}$$

$$\alpha^r + \beta^r = (\alpha + \beta)^r - r\alpha\beta$$

$$\alpha^r + \beta^r = 1 - r\alpha\beta$$

$$(\alpha - \beta)^r = \frac{9}{r}$$

$$|\alpha - \beta| = \frac{r}{9}$$

$$x = \frac{1-d}{r} = -r$$

$$S(-r, -\frac{1}{r})$$

$$y = a(x+r)^r - \frac{1}{r}$$

$$a\left(\frac{r}{9} + r\right)^r - \frac{1}{r} = 0$$

$$a = \frac{r}{r^9}$$

$$B = \frac{r}{r^9} (r)^r - \frac{1}{r}$$

$$B = -\frac{13}{91}$$

$$\alpha + \beta = -9$$

$$\alpha\beta = a$$

$$\alpha = -r - \sqrt{r}$$

$$\beta = -r + \sqrt{r}$$

$$a = \alpha\beta = 9 - r = \sqrt{6}$$

$$\frac{\alpha + \beta}{\alpha\beta} = d \Leftrightarrow$$

$$\alpha + \beta = \frac{m + 1/r}{r^9}$$

$$\alpha\beta = \frac{1}{r^9}$$

$$m + 1/r = -d$$

$$m = -9$$

$$\frac{r}{m} = \frac{r}{-9}$$

$$\frac{r}{-9}$$

4

5

6

7

8

10