

رہنما

ماتریکس کی 1: محمد رضا دلتا

$$15. 5, 5, 10$$

$$x^2 - 4x + 8 = 0$$

1) 2 روش مربع کامل

$$\Rightarrow (x^2 - 4x + 4) + (-2x + 8) = 0$$

$$\Rightarrow (x - 2)^2 - 2(x - 2) = 0$$

$$\Rightarrow (x - 2 - 2)(x - 2) = 0 \Rightarrow (x - 4)(x - 2) = 0 \Rightarrow x = 2, 4$$

$$x^2 + 8x + 7 = 0$$

$$\Rightarrow x^2 + 8x + 14 - 9 = 0$$

$$\Rightarrow (x + 4)^2 - 5 = 0$$

$$\Rightarrow (x + 4)(x + 1) = 0 \Rightarrow x = -1, -5$$

$$x^2 - 5x + 4 = 0$$

2) 2 روش عام مشترک

$$\Rightarrow (x - 4)(x - 1) = 0 \Rightarrow x = 1, 4$$

$$x^2 - 5x - 14 = 0$$

$$\Rightarrow (x - 7)(x + 2) = 0 \Rightarrow x = 7, -2$$

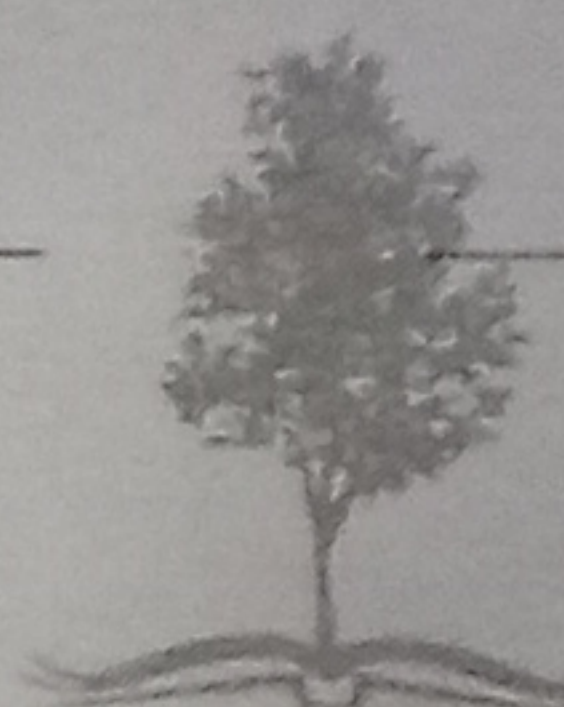
$$x^2 - 5x - 6 = 0$$

3) روش دلتا

$$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(1)(-6)}}{2} = \frac{5 \pm \sqrt{25 + 24}}{2} = \frac{5 + \sqrt{49}}{2}, \frac{5 - \sqrt{49}}{2}$$

$$2x^2 - 5x + \frac{1}{2} = 0$$

$$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(2)(\frac{1}{2})}}{4} = \frac{5 \pm \sqrt{25 - 4}}{4} = 1 + \frac{\sqrt{21}}{4}, 1 - \frac{\sqrt{21}}{4}$$



$$x^2 - 5x + 2 = 0$$

۴) روش دلتا

$$a + b + c = 0 \Rightarrow x \rightarrow \frac{1}{c} \rightarrow x = 1, 2$$

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

$$a + c = b \Rightarrow x \rightarrow -1 \Rightarrow x = -1, \frac{2}{3}$$

$$x^2 - 12x + 20 = 0$$

۵) روش دلتا

$$\Rightarrow x^2 - 12x + 20 = 0$$

$$\Rightarrow (x - 2)(x - 10) = 0 \Rightarrow x = \frac{20}{10}, \frac{20}{2}$$

$$x^2 - 10x + 20 = 0$$

$$\Rightarrow x^2 - 10x + 25 = 0$$

$$\Rightarrow (x - 5)(x - 5) = 0 \Rightarrow x = \frac{25}{5}, \frac{25}{5}$$

$$-x^2 + 2x - 1 = 0$$

۶)

$$\Delta = 2^2 - 4 \times (-1) \times (-1) = 0 \rightarrow \text{ریشه دارد}$$

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

$$\Delta = 1 - 4 \times 2 \times 2 = -15 \rightarrow \text{ریشه ندارد}$$

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

$$\Delta = 16 - 4 \times 2 \times 2 = 0 \rightarrow \text{ریشه دارد}$$

$$x^2 - x + 1 = 0$$

$$\Delta = 1 - 4 \times 1 \times 1 = -3 \rightarrow \text{ریشه ندارد}$$



$$x^2 - 5x + a = 0$$

1✓

$$\Delta = 9 - 4 \times 1 \times a = 9 - 4a \Rightarrow a \rightarrow \frac{9}{4} \Rightarrow \Delta = 0 \checkmark$$

$$\Delta > 0$$

$$\Delta = 9 - 4a \Rightarrow 9 - 4a = 0 \Rightarrow a = \frac{9}{4}$$

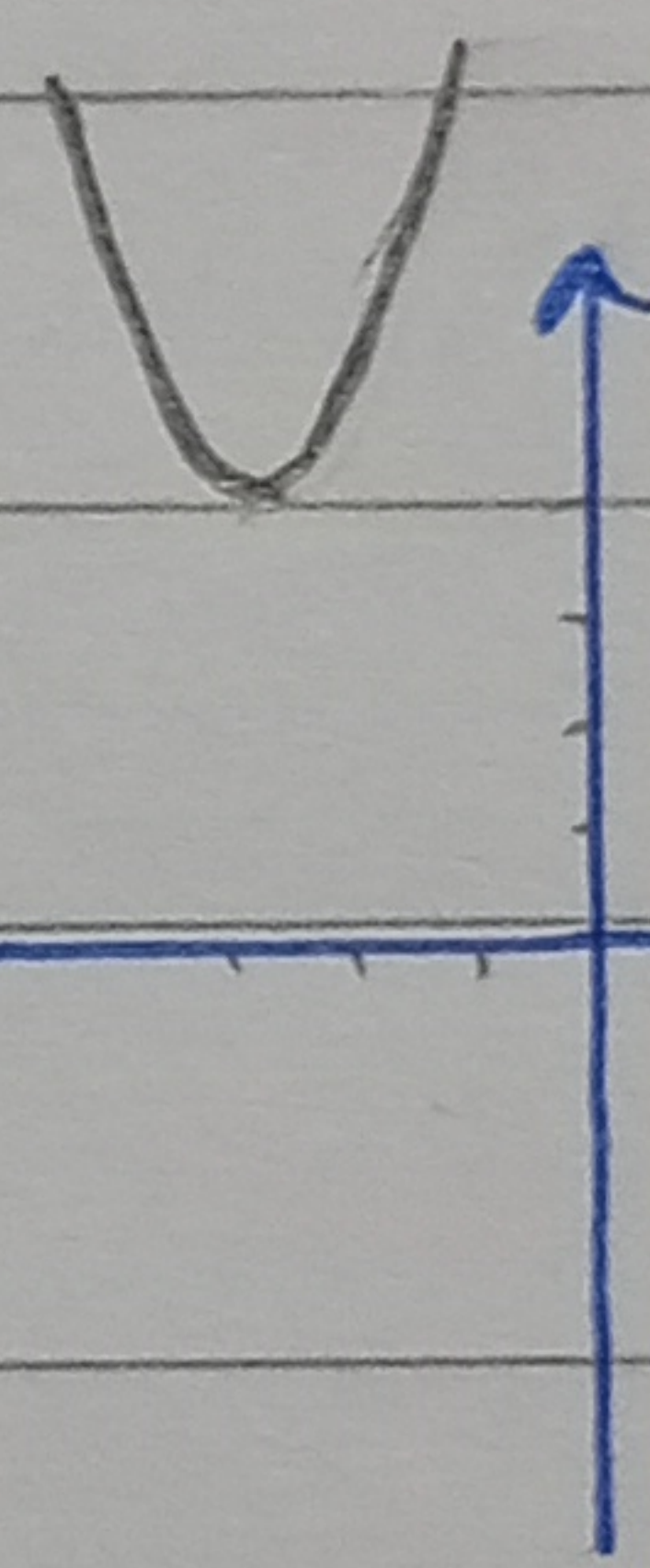
$$\Delta = 0$$

$$\Delta = 9 - 4a \Rightarrow a \rightarrow 2 \Rightarrow 9 - 4 \times 2 = -1 \Rightarrow \Delta = -1 \checkmark$$

$$\Delta < 0$$

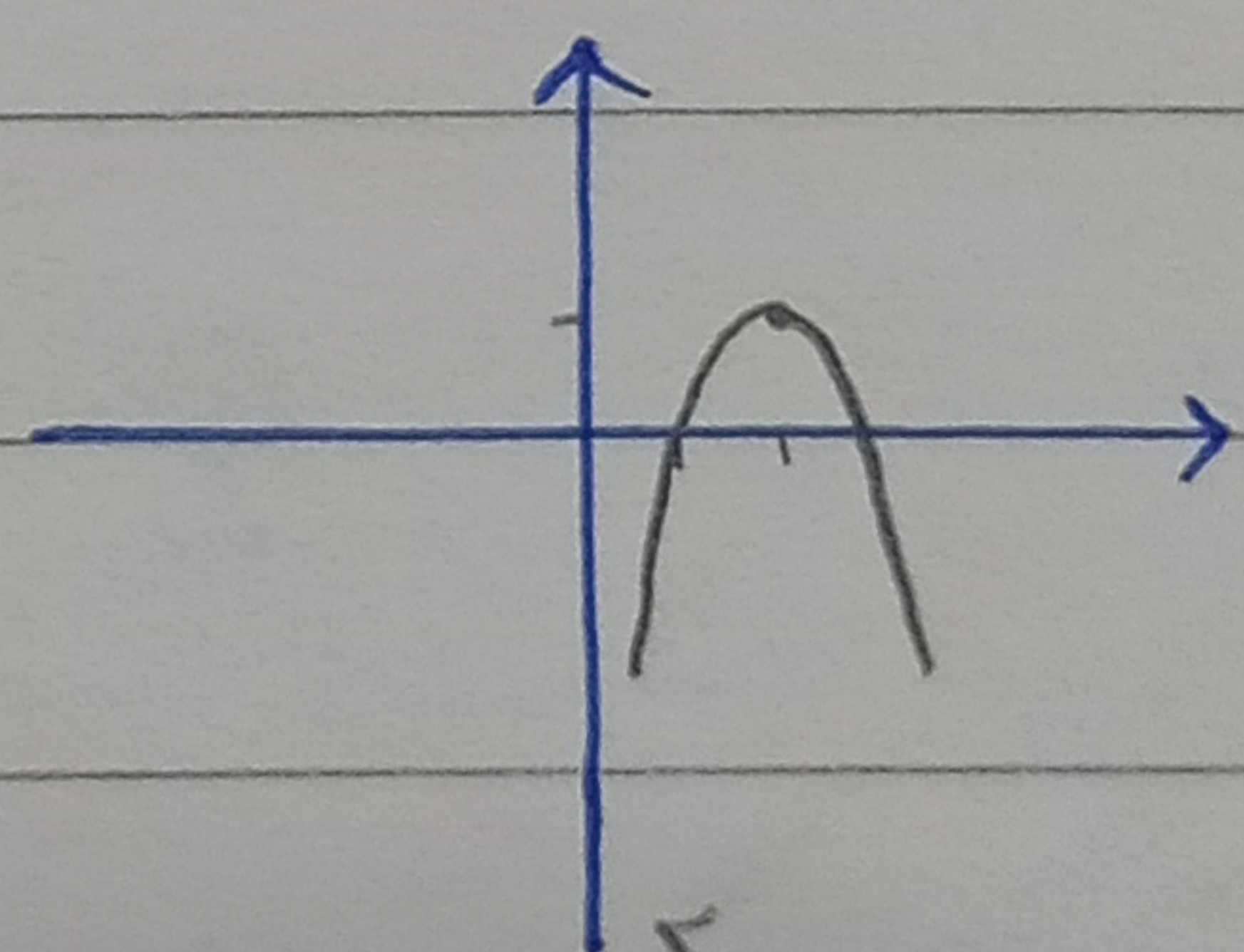
$$\Delta = 9 - 4a \Rightarrow a \rightarrow 1 \Rightarrow \Delta = 9 - 4 = 5 \checkmark$$

$$\Delta = 5$$



2✓

$$\text{Min} \left| -\frac{b}{2a} = \frac{-4}{2} = -2 \right| \Rightarrow$$



3✓

$$\text{Max} \left| -\frac{b}{2a} = \frac{-4}{-2} = 2 \right| \Rightarrow$$

$$y = -x^2 + 5x - 2 \xrightarrow{y=0} -x^2 + 5x - 2 = 0 \Rightarrow x^2 - 5x + 2 = 0$$

$$\Rightarrow (x-2)(x-1) = 0 \Rightarrow x = 1, 2$$

$$x^2 - 5x + 2 = 0 \quad S = -\frac{b}{a} = \frac{5}{1} = 5 \quad P = \frac{c}{a} = \frac{-2}{1} = -2$$

4✓

$$S^2 - 2P = 9 - 2 \times (-2) = 13$$

$$S^2 - 4SP = 25 - 4 \times 1 \times (-2) = 33$$

