

الف) $(9, x+2y), (12-x, -1)$

$$\begin{cases} x-3 \\ x+2y = 12 \\ 12-x = 9 \end{cases} \rightarrow \begin{cases} x+2y = 12 \\ x-y = 9 \end{cases}$$

$$\begin{aligned} & -3y = 3 \\ & y = -1 \end{aligned}$$

$$\frac{x}{y} = \frac{12}{-1}$$

(1)

ب) $(-1, -2), (\frac{1}{x} - \frac{1}{y}, \frac{d}{x} - \frac{v}{y})$

$$\begin{cases} -\frac{1}{x} - \frac{1}{y} = -1 \\ \frac{d}{x} - \frac{v}{y} = -2 \end{cases} \rightarrow \begin{cases} \frac{1}{x} + 1 = \frac{-1}{-y} \\ \frac{d}{x} - \frac{v}{y} = -2 \end{cases}$$

$$\begin{aligned} & \frac{1}{x} + 1 = \frac{1}{y} \\ & \frac{1}{x} = \frac{1}{y} - 1 \end{aligned}$$

$$\begin{aligned} & \frac{d}{x} - \frac{v}{y} = -2 \\ & \frac{d}{\frac{1}{y} - 1} - \frac{v}{y} = -2 \end{aligned}$$

$$\begin{aligned} & \frac{d}{y} - \frac{v}{y} = -2 \\ & \frac{d-v}{y} = -2 \end{aligned}$$

$$\begin{aligned} & d-v = -2y \\ & y = -1 \end{aligned}$$

$$\frac{x}{y} = \frac{1}{-1}$$

$f = \{(a, 2a), (1, a+1), (1, -2), (2, b)\}$

$$\begin{aligned} a+1 &= -2 \\ a &= -3 \end{aligned}$$

(2)

$$f(a) + 2f(2) = 2f(1)$$

$$2a + 2(4) = 2(a+1)$$

$$2a + 8 = 2a + 2$$

$$6 = 0$$

$$b = 0$$

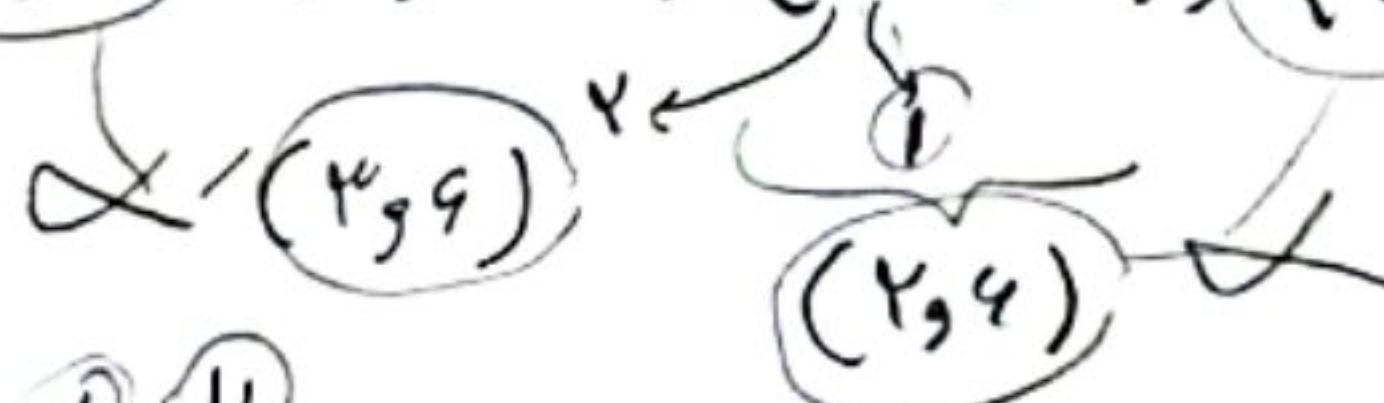
$f = \{(1, m^2 - 2m), (2, d), (1, -2), (m+1, 6), (2, 4), (m^2 + 2, 4m+1)\}$

(3)

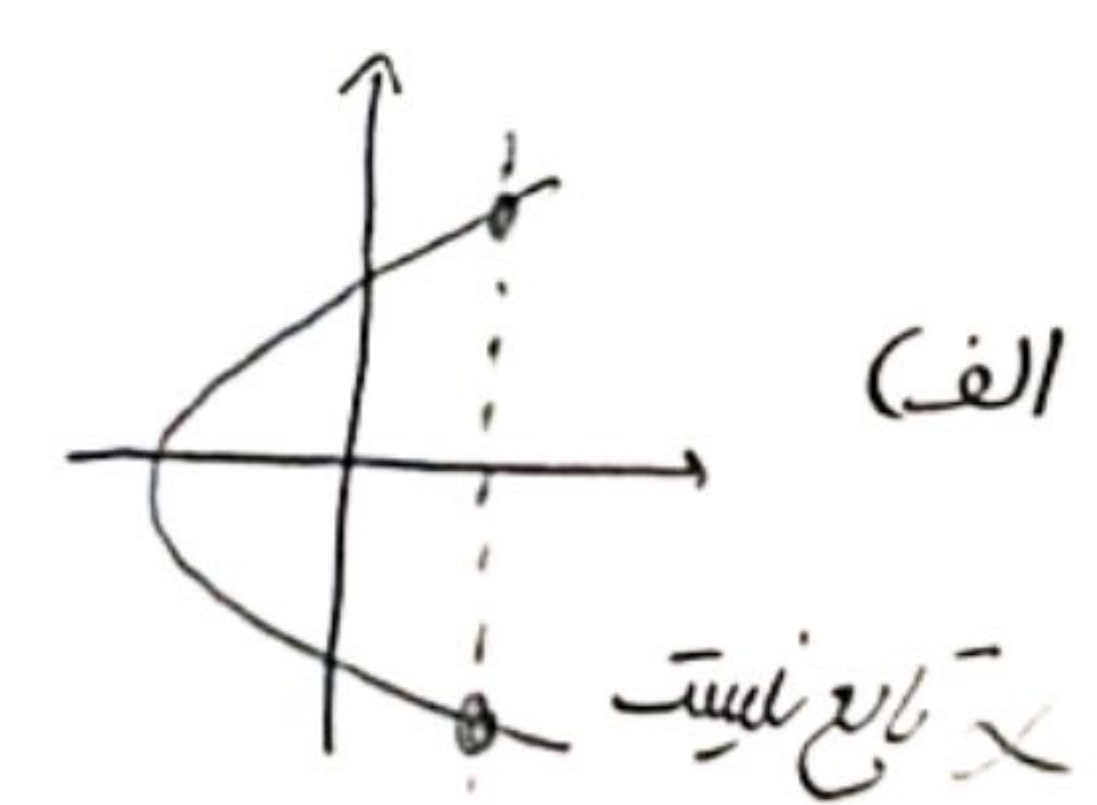
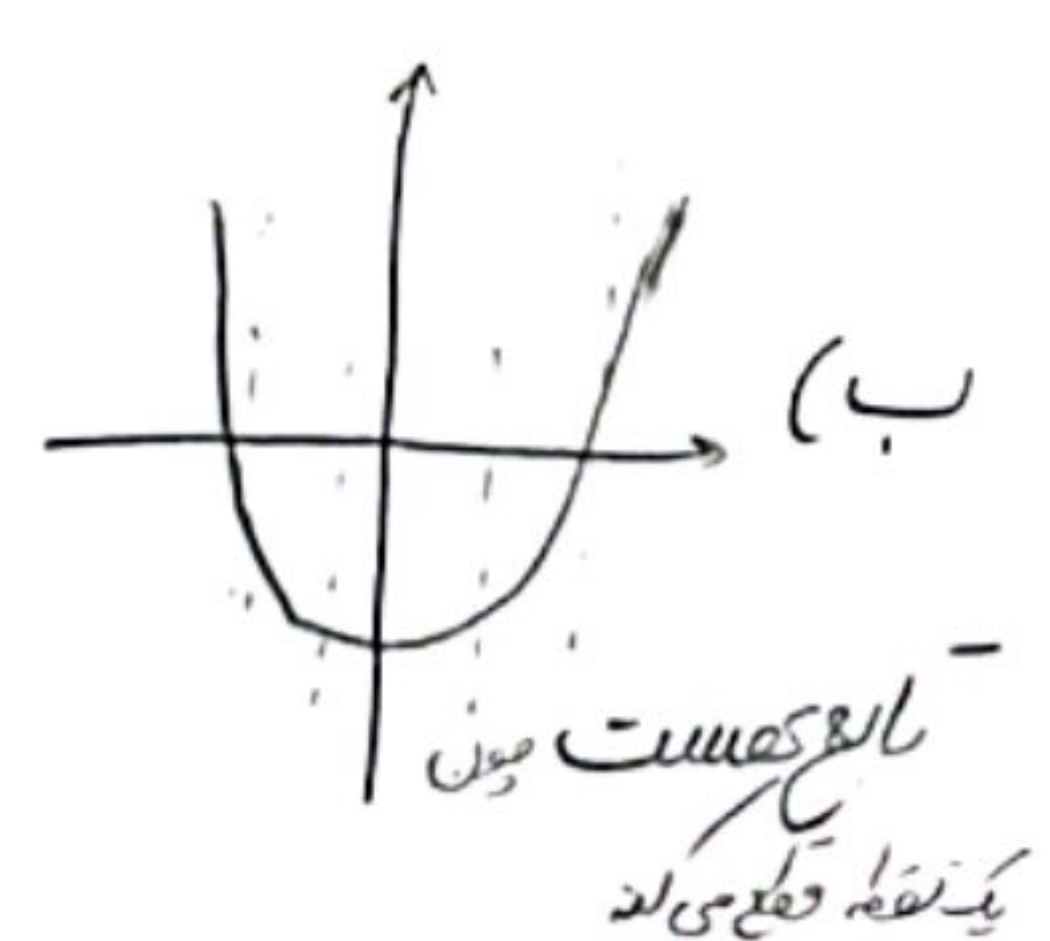
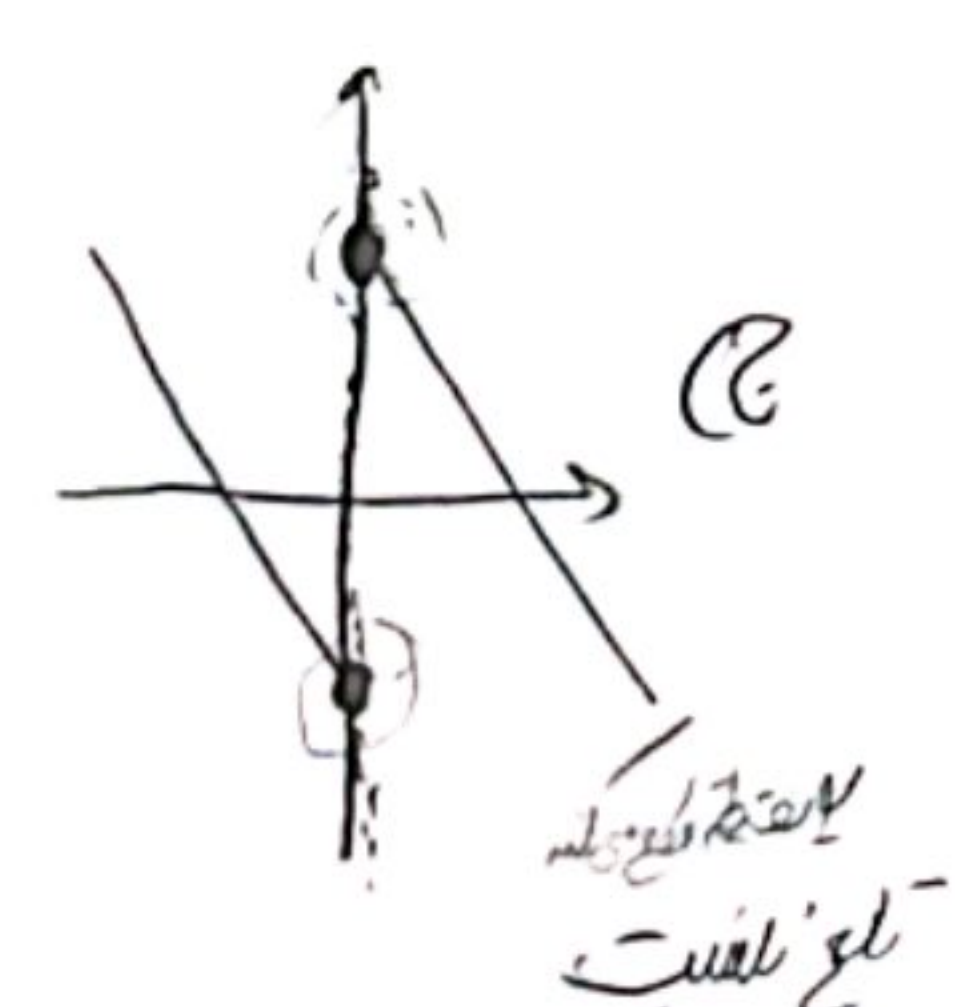
$$m^2 - 2m = -2$$

$$m(m-2) = -2$$

$$m = 1, 2$$

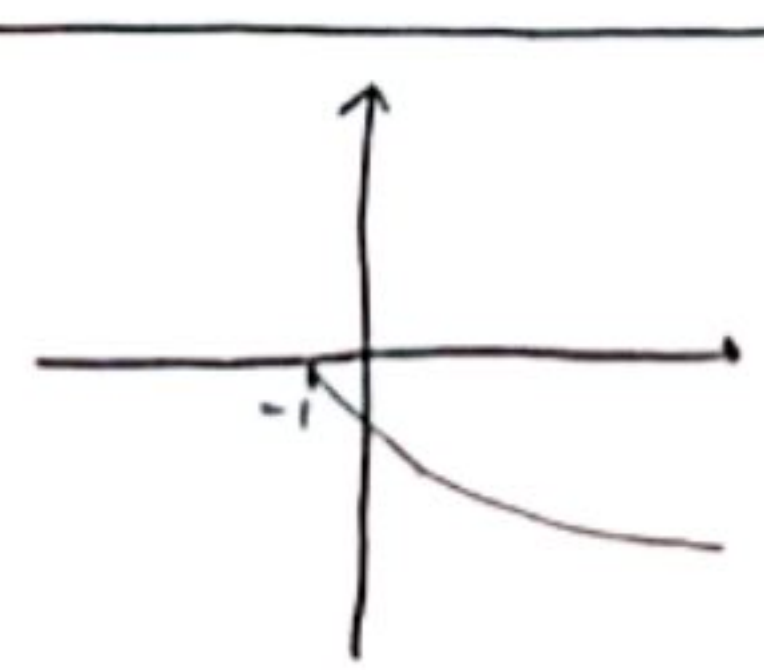


سویب از این هیچ مقدار m



(4)

الف) $y = -\sqrt{x+1}$ تابع مستقیم ✓



(5)

ب) $x = \frac{y^2}{1-y^2}$

$y = 0$
 $y = \pm 1$

تابع سهمی

الف) $|y| = x \rightarrow 1$ \rightarrow $\frac{1}{x}$ \rightarrow $\frac{1}{x}$

9

ب) $y^{\mu} + \mu y^{\nu} + \mu y + a^{\mu} + a = 0 \rightarrow y^{\mu} + \mu y^{\nu} = -a^{\mu} - a$

$f(x) = \frac{x^{\nu} + bx + a}{x^{\nu} + bx + v} \rightarrow f(\sqrt{\mu} - \nu) = \frac{(\sqrt{\mu} - \nu)^{\nu} + b(\sqrt{\mu} - \nu) + a}{(\sqrt{\mu} - \nu)^{\nu} + b(\sqrt{\mu} - \nu) + v} = \frac{\mu}{\nu} = \frac{\nu}{\mu}$

10

$f(\sqrt{\mu} - \nu)$

$y - \nu x + a = 0 \xrightarrow{(-1, -a)} -1 + \nu + a = 0 \rightarrow a = 1$

$x^{\nu} + 1x^{\nu} - \nu = \nu x - 1$

11

$f(x) = ax^{\nu} + bx + c \rightarrow -1 = -1 + b \Rightarrow b = -\nu$

$x^{\nu} - \nu x - 1 = 0$

$\frac{x^{\nu} - \nu x - 1}{x - x^{\nu}} \left| \frac{x+1}{x^{\nu} - x - 1} \right.$

$\frac{x^{\nu}}{x} = x^{\nu-1}$ $\frac{-x^{\nu}}{x} = -x^{\nu-1}$

توجه در مرتبه دیگر $x = -1$ \rightarrow $x + 1$ \rightarrow $x^{\nu} + 1$

$-x^{\nu} - \nu x - 1$

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

$+x^{\nu} + 1x$

$-\frac{1}{1} \left| \frac{x+1}{x^{\nu} - x - 1} \right. = -\frac{b}{a}$

$\frac{-1x - 1}{x^{\nu} + 1}$

$f = \{ (\nu, a+b), (b, \nu a), (-1, a - \nu b + 1) \}$

$a - \nu b + 1 = a + b$

9

$-\nu b = -1$

$a + b = \nu a$

$b = \frac{1}{\nu}$

$\frac{1}{\nu}$

$a = \frac{1}{\nu}$

$-a = -\frac{1}{\nu}$

$\frac{1}{\nu}$

$f(x) = \frac{ax^{\nu} - bx + c + 1}{bx + \mu}$

$f(0) = 0 \rightarrow 0 = \frac{c+1}{\mu} \rightarrow c = -1$

10

$\frac{a+b+c}{1-1} = 1 \Rightarrow 1-1 = 0$

$f(1) = 1 \rightarrow 1 = \frac{a-b}{b+\mu} \rightarrow 1 = a+b$