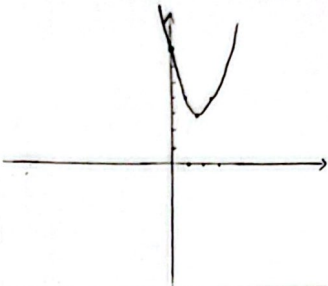
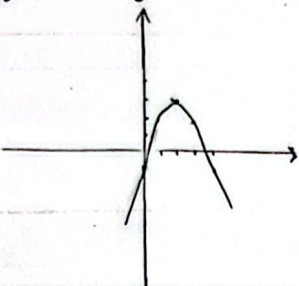


الف) $C = 7 / x \leq \frac{b}{x_0} \leq 7 \Rightarrow y \leq 4 - 1 + 7 = 10$	ب) $C = -1 / x \leq \frac{b}{x_0} \leq -1 \Rightarrow y \leq -4 + 1 - 1 = -4$
	

الف) $\Delta > 0 \rightarrow (m+1)^2 - 4(\frac{1}{4}m+2) > 0 \Rightarrow m^2 - 2m - 1 > 0 \Rightarrow \Delta \leq 4, m \leq 2, -3 \rightarrow \frac{-3}{1+1} \rightarrow (-3, 2) \cup (2, +\infty)$	۱
ب) $\Delta = 0 \rightarrow (m+1)^2 - 4(\frac{1}{4}m+2) = 0 \Rightarrow m^2 - 2m - 1 = 0, (m-2)(m+3) = 0 \Rightarrow m = 2, -3$	
ج) $\Delta < 0 \rightarrow m^2 - 2m - 1 < 0, m \leq 2, -3 \rightarrow \frac{-3}{1+1} \rightarrow (-3, 2)$	۲
د) $\Delta > 0 \rightarrow m^2 - 2m - 1 > 0 \rightarrow \frac{-3}{1+1} \rightarrow R - (-3, 2)$	

الف) $\Delta > 0 \rightarrow (-2m-2)^2 - 4(m-2) > 0 \Rightarrow m^2 - 4m + 4 > 0 \rightarrow$ همواره مثبت $\frac{c}{a} \leq \frac{1}{m-2} > 0 \Rightarrow m-2 > 0, m > 2 / \frac{-b}{a} \leq \frac{2m+2}{m-2} < 0 \rightarrow \frac{-1}{1+1} \rightarrow (-1, 2)$ با هیچ مقدار m در هیچ نقطه از $(-1, 2) = \emptyset$ $\Rightarrow P = \emptyset$	۳
ب) $\Delta > 0, m^2 - 4m + 4 > 0$ همواره مثبت $x_1 < 0 < x_2, x_1 > x_2 \Rightarrow x_1 x_2 < 0, x_1 + x_2 < 0$ $\frac{c}{a} \leq \frac{1}{m-2} < 0, m-2 < 0, m < 2, \frac{-b}{a} < 0 \Rightarrow \frac{2m+2}{m-2} < 0 \rightarrow \frac{-1}{1+1} \rightarrow (-1, 2) \Rightarrow \text{د) و ب) و ج) و الف)}$ ①	

الف) $\Delta > 0 \rightarrow (-2m-2)^2 - 4(m-2) = 4m^2 - 8m + 8 > 0 \Rightarrow m^2 - 2m + 2 > 0 \rightarrow$ همواره مثبت است دایره فقط برای $a=0$ باشد $m \neq 2$ برای رد شدن از ۴ ناحیه باید یک شبهه داشته باشیم $\Rightarrow \frac{c}{a} < 0 \rightarrow \frac{1}{m-2} < 0 \xrightarrow{1 > 0} m-2 < 0 \Rightarrow m < 2$	۴
ب) $\frac{-b}{x_0} \leq -2 \Rightarrow -b \leq -2a, b \leq 2a \Rightarrow -2m-2 = 2m-4 \Rightarrow -4m = -4, m = 1$	

$\Delta = 0 \rightarrow 4(\frac{y}{x} x^2 - 2 \sin \alpha x + \frac{y}{x}) = 0 \Rightarrow 4x^2 - 4 \sin \alpha x + 4 = 0 \Rightarrow \Delta = 16 \sin^2 \alpha - 16 = 0$ $16(\sin^2 \alpha - 1) = 0 \Rightarrow \cos \alpha = 0, \alpha \leq \pi + \frac{\pi}{2} \rightarrow \sin \alpha = -1 + 1$ $x = \frac{-b}{x_0} \leq \frac{1 + 2 \sin \alpha}{1} = \frac{3}{1} \sin \alpha \xrightarrow{\alpha = -\frac{\pi}{2}} x = -\frac{3}{1}$ و $\sin \alpha = 1 \xrightarrow{\alpha = \frac{\pi}{2}} x = \frac{3}{1}$ قابل قبول	۵
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$$y = \frac{(1-x)(-13x-1)(12x-\omega)(x+1)}{(1-x)(1-x)} = (-13x-1)(12x-\omega) = -4x^2 + 12x - \omega x - 12x^2 + \omega x + \omega = -4x^2 + 12x + \omega$$

$$x_{max} = \frac{-b}{2a} = \frac{-12}{-8} = \frac{3}{2} \Rightarrow y_{max} = -4\left(\frac{3}{2}\right)^2 + 12\left(\frac{3}{2}\right) + \omega = \frac{9}{1}$$

6

$$ws = \omega p + v \rightarrow s = \frac{-b}{a} = \frac{m+p}{m}, p = \frac{c}{a} = \frac{-v}{m} \Rightarrow w\left(\frac{m+p}{m}\right) = \omega\left(\frac{-v}{m}\right) + v$$

$$\frac{wm+p+10}{m} = v, \quad 3m+14 = vm \Rightarrow m=14, m \neq 7$$

$$\alpha^2 + \beta^2 (\alpha + \beta)^2 - 2\alpha\beta = \left(\frac{w}{v}\right)^2 - 2\left(\frac{-1}{v}\right) = \frac{9}{f} + 1 = \frac{12}{f}$$

$$\alpha + \beta = \frac{c+p}{f} = \frac{4}{f} = \frac{w}{v}, \quad \alpha\beta = \frac{-v}{f} = -\frac{1}{v}$$

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$$\frac{c\alpha + \beta^2}{\omega\beta^2} = \frac{c\alpha}{\omega\beta^2} + \frac{\beta^2}{\omega\beta^2} = \frac{c\alpha}{\omega\beta^2} + \frac{\beta}{\omega} \quad / \quad \alpha\beta = \frac{c}{a} = v \Rightarrow \beta = \frac{v}{\alpha} \Rightarrow \frac{c\alpha}{\omega\beta^2} = \frac{c\alpha}{\omega} \cdot \frac{\alpha^2}{v^2} = \frac{c\alpha^3}{\omega v^2}$$

$$\Rightarrow \frac{\alpha^3}{\omega} + \frac{\beta^3}{\omega} = \frac{5^3 - 3 \cdot 5 \cdot p}{\omega} = \frac{125 - 3(5)(\omega)}{\omega} = \frac{9\omega}{\omega} = 9$$

$$s = \omega, \quad p = v$$

8

$$x = -3, x = 2 \Rightarrow a x^2 + b x + c = 2x + 6 \xrightarrow{x=2} c + 4b + c = 12 \Rightarrow c + 4b = 10, \quad a + b = \omega$$

$$x = -3, \quad 9a - 3b + c = 1 \Rightarrow 9a - 3b = 0, \quad 3a = b \Rightarrow 2a + 3a = \omega, \quad \omega a = \omega, \quad a = 1 \Rightarrow b = 3$$

$$y = ax^2 + bx + c \Rightarrow x = \frac{-b}{2a} = \frac{-3}{2}$$

9

$$y = ax^2 + bx + c \Rightarrow y = a \Rightarrow 2x^2 + (m+1)x + m+4 = a \Rightarrow 2x^2 + (m+1)x - x + m+4 = 0$$

$$2x^2 + mx + x + m + 4 = 0 \Rightarrow 2x^2 + mx + m + 4 \xrightarrow{\Delta \geq 0} \Delta = m^2 - 4m - 4$$

$$m = \frac{4 \pm \sqrt{16+4}}{2} = \frac{4 \pm 5}{2} \Rightarrow m = 4.5, -0.5$$

اگر $m = 4.5$ ← نقطه برخورد $(-3, -3)$ در ناحیه اول

اگر $m = -0.5$ ← نقطه برخورد $(1, 1)$ در ناحیه اول و ناحیه دوم

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