

$y = ax^2 + bx + c \rightarrow$ دایره $= -\frac{b}{2a} \rightarrow -\frac{b}{-2} = \left(\frac{b}{2}\right) \rightarrow y_{\max} = -\left(\frac{b}{2}\right)^2 + b\left(\frac{b}{2}\right) + 3 = -\frac{b^2}{4} + \frac{b^2}{2} + 3$
 ضریب x $\rightarrow \frac{b^2}{2} + 3 = 7 \rightarrow \frac{b^2}{2} = 4 \rightarrow b^2 = 8 \rightarrow b = \pm 2\sqrt{2}$
 دایره سی و دو واحد

الف) $f(x) = x^2 + 2x^2 + 3 \rightarrow x^2 + 2x^2 + 3 = 0 \xrightarrow{x^2=t} t^2 + 2t + 3 = 0 \xrightarrow{\Delta} 4 - 12 = -8 < 0 \rightarrow \Delta < 0$
 دایره این تابع منحنی ندارد

ب) $f(x) = (4 - x^2)^2 - 2(4 - x^2) - 1 \xrightarrow{4 - x^2=t} t^2 - 2t - 1 = 0 \xrightarrow{\Delta} 4 + 4 = 8 > 0 \rightarrow \Delta > 0$
 غرض $\rightarrow$ دایره منحنی ندارد $\rightarrow x^2 = -1 \rightarrow$ دایره منحنی ندارد
 $t = \frac{2 \pm \sqrt{8}}{2} \xrightarrow{\Delta} 4 - x^2 = 4 \rightarrow x^2 = 0 \rightarrow x = 0$
 $t = \frac{2 \pm \sqrt{8}}{2} \xrightarrow{-2} 4 - x^2 = 2 \rightarrow x^2 = 2 \rightarrow x = \pm \sqrt{2}$

$4x^2 - 14x + m = 0 \rightarrow x_1 = x_2 \rightarrow x_1 + x_2 = -\frac{b}{a} \rightarrow x + (x+2) = 4 \rightarrow 2x+2=4 \rightarrow x=1$
 $x_1 x_2 = \frac{c}{a} \rightarrow x(x+2) = 1 \times 3 = 3 \rightarrow \frac{c}{a} = \frac{m}{4}$
 $\rightarrow \frac{m}{4} = 3 \rightarrow m = 12$ و $x_1 = 1$ و $x_2 = 3$

$3x^2 - 4x + m - 1 = 0 \rightarrow x_1 + x_2 = -\frac{b}{a} = \frac{4}{3} \rightarrow x_1 + x_2(x+\beta) = 4 \rightarrow \beta = 4 - x$
 $2x - \beta = 4$
 $x_1 x_2 = \frac{m-1}{3} \rightarrow 2 \times 0 = 0 = \frac{m-1}{3} \rightarrow m-1 = 0 \rightarrow m = 1$
 $\hookrightarrow 2x - (4 - x) = 4 \rightarrow 2x - 4 + x = 4 \rightarrow 3x = 8 \rightarrow x = \frac{8}{3}$ و $\beta = 0$

$-mx^2 + 4x + m^2 - 2 = 0$
 دایره منحنی ندارد $\rightarrow \frac{m^2 - 2}{-m} = 1 \rightarrow -m = m^2 - 2 \rightarrow m^2 + m - 2 = 0 \rightarrow (m+2)(m-1) = 0 \rightarrow m = -2$
 حاصل ضرب دایره $\rightarrow \Delta > 0 \rightarrow 16 + 4m(m^2 - 2) = 16m^3 - 8m + 16$
 $\rightarrow m = -1 \rightarrow -mx^2 + 4x - 1 = 0 \rightarrow x^2 - 4x + 1 = 0 \rightarrow x = \frac{4 \pm \sqrt{12}}{2} = 2 \pm \sqrt{3}$
 $m = 1$

$$2x^2 - mx + 3 = 0 \rightarrow \alpha + \beta = m$$

$$\alpha\beta = 3 \rightarrow \alpha = \frac{3}{\beta}$$

$$\alpha\beta^2 = 4$$

$$\hookrightarrow \frac{3}{\beta} \times \beta^2 = 4 \rightarrow 3\beta = 4 \rightarrow \beta = \left(\frac{4}{3}\right), \alpha = \frac{3}{\beta} = \frac{3}{\frac{4}{3}} = \left(\frac{9}{4}\right)$$

$$m = \frac{9}{4} + \frac{4}{3} = \frac{27+16}{12} = \left(\frac{43}{12}\right)$$

$$2x^2 - 4x + m = 0 \rightarrow \alpha + \beta = 4 \rightarrow 3\beta + \beta = 4 \rightarrow 4\beta = 4 \rightarrow \beta = 1, \alpha = 3$$

$$\alpha\beta = m \rightarrow 1 \times \alpha = m \rightarrow 1 \times 3 = m \rightarrow m = 3$$

$$\alpha = 3\beta$$

$$2x^2 - vx + 2 = 0 \rightarrow \alpha^2 - v\alpha + 2 = 0 \rightarrow \alpha^2 = v\alpha - 2$$

$$\alpha\beta = 2 \rightarrow \frac{1}{\alpha} = \frac{\beta}{2}$$

$$\left(\alpha^2 + \frac{1}{\alpha^2}\right) = \beta^2$$

$$\hookrightarrow \alpha \cdot \alpha^2$$

$$\rightarrow \alpha^3 + \beta^3 = (\alpha + \beta)^3 - 3\alpha\beta(\alpha + \beta) \rightarrow \alpha^3 + \beta^3 = 3(4)^3 - 3(2)(4) = 48$$

$$\hookrightarrow \alpha(v\alpha - 2) = v\alpha^2 - 2\alpha \rightarrow v(v\alpha - 2) - 2\alpha = 4v\alpha - 16$$

$$h(t) = -1 \cdot t^2 + 50t \rightarrow t_{max} = -\frac{b}{2a} = -\frac{50}{-2} = \frac{50}{2} = 25 \rightarrow \text{زمان رسیدن به بیشترین ارتفاع}$$

$$h_{max} = -1(25)^2 + 50(25) = 625$$

$$h(t) = -1 \cdot t^2 + 50t = 0 \rightarrow -1 \cdot t(t - 50) = 0 \rightarrow t = 0 \rightarrow \text{در زمان 0}$$

$$t = 50 \rightarrow \text{در زمان 50}$$

$$(x-1)^2 = 2x+1$$

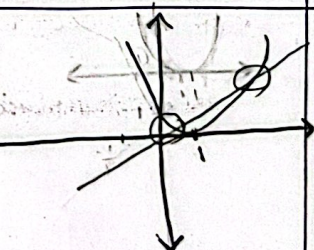
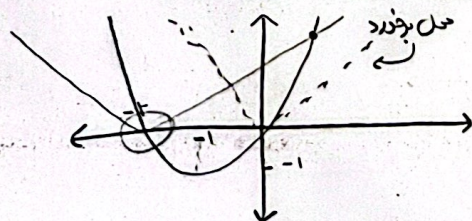
$$x^2 - 2x + 1 = 2x + 1$$

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

$$x = 0 \text{ و } 4$$

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

$$x = -2 \pm 1$$



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

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

$$x = -2 \text{ و } x = 1$$