

$$\begin{array}{r} 3x^2 + 2x + m \\ \underline{3x^2 + 6x + 16} \\ -4x + m \end{array} \quad \begin{array}{r} x + 2 \\ \underline{3x^2 - 6x + 16} \end{array} \quad (1)$$

$$\begin{array}{r} -4x + m \\ \underline{+ 4x^2 - 12x} \\ 16x + m \\ \underline{16x + 32} \\ m - 32 \end{array} \quad m - 32 = 0 \Rightarrow m = 32$$

$$الف) (x^2 - x - 2)^2 = x^4 - x^2 + 4 - 2x^2 - 2x^2 + 4x - x^2 - 2x^2 - 2x^2 + 4x - 4 \quad (2)$$

$$ب) (x^2 - 1)^2 = (x^2)^2 - 2(x^2)(1) + (1)^2 = x^4 - 2x^2 + 1$$

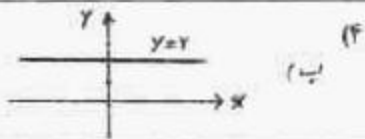
$$ج) (x^2 + xy)(x^2 - xy) = (x^2)^2 - (xy)^2 = x^4 - x^2y^2$$

$$A = \frac{2}{x-2} \Rightarrow D_A = R - \{2\}, A+B = \frac{2x+1}{x^2-2} \Rightarrow \frac{2}{x-2} + B = \frac{2x+1}{x^2-2} \quad (3)$$

$$B = \frac{2x+1}{x^2-2} - \frac{2}{x-2} = \frac{2x+1-2x-2}{(x-2)(x+2)} = \frac{-1}{(x-2)(x+2)}$$

$$a = -3 \text{ و } b = 7 \text{ و } c = -4$$

$$\frac{|a|}{|c|} \cdot \frac{|b|}{|c|} = \frac{|-3| \cdot |7|}{| -4 | \cdot | -4 |} = \frac{3 \cdot 7}{4 \cdot 4} = \frac{21}{16} \quad (الف)$$



$$A(-1, 1) \text{ و } 2x + y = 2 \quad y = ax + b \quad \begin{cases} \text{شیب خط} = a \\ \text{شیب خط} = -2 \end{cases} = a(-2) = -1 \Rightarrow a = \frac{1}{2} \quad (5)$$

$$y = \frac{1}{2}x + b = 1 = \frac{1}{2}(-1) + b \Rightarrow b = \frac{3}{2} \Rightarrow y = \frac{1}{2}x + \frac{3}{2}$$

$$الف) \frac{2 + \sqrt{2}}{\sqrt{2} + \sqrt{3}} \times \frac{\sqrt{2} - \sqrt{3}}{\sqrt{2} - \sqrt{3}} = \frac{2\sqrt{2} - 2\sqrt{3} + \sqrt{2} - \sqrt{6}}{2-3} = \frac{\sqrt{6}}{1} \quad (6)$$

$$ب) (\sqrt{2 + \sqrt{2}})(\sqrt{2 - \sqrt{2}}) = \sqrt{(2 + \sqrt{2})(2 - \sqrt{2})} = \sqrt{4 - 2} = \sqrt{2}$$

$$\sin \theta = \frac{-r}{\delta} \text{ و } r = 1.0 \text{ و } (\theta \text{ در ربع سوم}) \quad (7)$$

$$\begin{cases} x = r \cos \theta \\ y = r \sin \theta \end{cases} = \begin{cases} \cos \theta = \frac{y}{r} \\ \sin \theta = \frac{-r}{\delta} \end{cases} \Rightarrow \frac{-r}{\delta} = \frac{y}{1.0} \Rightarrow y = 1.0 \left( \frac{-r}{\delta} \right) = -r \Rightarrow y = -r$$

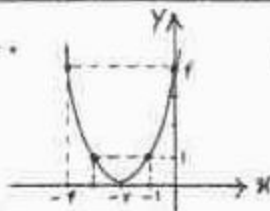
$$x^2 + y^2 = r^2 \Rightarrow x = \pm \sqrt{r^2 - y^2} = \pm \sqrt{1.0 - 1.0} = \pm \sqrt{0} = x = -\sqrt{0}$$

$$\cos \theta = \frac{x}{r} = \frac{-\sqrt{0}}{1.0}$$

$$y = x^2 + 2x + 1 \Rightarrow x_0 = \frac{-b}{2a} = \frac{-2}{2} = -1, \quad y_0 = (-1)^2 + 2(-1) + 1 = 0 \quad (8)$$

x	-2	-1	0	1	2
y	3	0	1	4	9

S(-1, 0)



$$2x + 1 = 6x + 9 \Rightarrow 1 - 9 = 6x - 2x \Rightarrow -8 = 4x \Rightarrow x = -2 \quad (9)$$

$$\frac{x+m}{2} + 2 = m \Rightarrow \frac{-2+m}{2} + 2 = m \Rightarrow -2+m+4 = 2m \Rightarrow m = 2$$

$$x = 2 \Rightarrow 2x^2 - mx - 2 = 0 \Rightarrow 2(2)^2 - m(2) - 2 = 0 \quad (10)$$

$$8 - 2m - 2 = 0 \Rightarrow -2m = -6 \Rightarrow m = 3$$

$$y = (x+2)(x+1) \Rightarrow y = 0 \Rightarrow \begin{cases} x+2=0 \Rightarrow x=-2 \\ x+1=0 \Rightarrow x=-1 \end{cases} \quad A(-2, 0), B(-1, 0) \quad (11)$$

$$M = \begin{cases} \frac{x_A + x_B}{2} = \frac{-2-1}{2} = -1.5 \\ \frac{y_A + y_B}{2} = \frac{0+0}{2} = 0 \end{cases} \Rightarrow M(-1.5, 0)$$

$$x^2 + \frac{x}{2} \geq (x-1)^2 \Rightarrow x^2 + \frac{x}{2} \geq x^2 - 2x + 1 \Rightarrow \frac{x}{2} + 2x \geq 1 \Rightarrow \frac{5x}{2} \geq 1 \Rightarrow 5x \geq 2 \Rightarrow x \geq \frac{2}{5} \quad \text{از دو طرف اول است.} \quad (12)$$

$$\text{الف) } A = x^2 y - 2y = y(x^2 - 2) = y(x-2)(x+2), \quad B = x^2 + 2x + 2 = (x+2)^2 \quad (13)$$

م.م.ب = عاملهای مشترک با کوچکترین توان = (x+2)

م.م.م = عاملهای مشترک با بزرگترین توان x عاملهای غیر مشترک = ک.م.م = (x+2)^2 (x-2) y

ب)  $xy^2 - 12xy^2 + 26x = x(y^2 - 12y^2 + 26) = x(y^2 - 4)(y^2 - 9) = x(y-2)(y+2)(y-3)(y+3)$

$$\text{الف) } y = x \Rightarrow A(x, x), \quad D = \sqrt{\lambda} \quad (14)$$

$$AO = \sqrt{\lambda} \Rightarrow \sqrt{(x-\cdot)^2 + (x-\cdot)^2} = \sqrt{\lambda} \Rightarrow \sqrt{2x^2} = \sqrt{\lambda} \Rightarrow 2x^2 = \lambda = x^2 = \cdot \Rightarrow x = \pm \cdot \Rightarrow x = \cdot \Rightarrow A(\cdot, \cdot)$$

$$\text{ب) } B(\cdot, \cdot, \cdot, \cdot) \text{ و } y = x \quad M \begin{pmatrix} \cdot m + \cdot + \cdot \\ \cdot \\ \cdot + \cdot m \\ \cdot \end{pmatrix} \quad M \begin{pmatrix} \cdot m + \cdot \\ \cdot \\ \cdot m - \cdot \\ \cdot \end{pmatrix}$$

$$A(\cdot m + \cdot, \cdot)$$

$$\frac{\cdot m + \cdot}{\cdot} = \frac{\cdot m + \cdot}{\cdot} \Rightarrow \cdot m + \cdot = \cdot m + \cdot \Rightarrow \cdot m = \cdot \Rightarrow m = \cdot$$

$$\text{الف) } \left(\frac{1}{\cdot}\right)^{\cdot} - (\sqrt{\cdot})^{\cdot} - (\sqrt{\cdot})^{\cdot} = \left(\frac{1}{\cdot}\right)^{\cdot} \Rightarrow 1^{\cdot} - \cdot - \cdot = \cdot \Rightarrow \cdot = \cdot \quad (15)$$

$$\text{ب) } \begin{cases} \tan \theta = \frac{x+1}{x} \\ \cot \theta = \frac{x}{x^2-1} \end{cases} \Rightarrow \tan \theta \cdot \cot \theta = 1 \quad \text{معلوم}$$

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

$$x(x^2-x-2) = 0 \Rightarrow x(x-\cdot)(x+1) = 0 \Rightarrow \begin{cases} x = \cdot \\ x = \cdot \\ x = -1 \end{cases}$$

$$\text{الف) } \sin^2 \theta - \cos^2 \theta = (\sin \theta - \cos \theta)(\sin \theta + \cos \theta) = \quad (16)$$

$$(\sin^2 \theta - \cos^2 \theta) \times 1 = \sin^2 \theta - (1 - \sin^2 \theta) = \sin^2 \theta - 1 + \sin^2 \theta = 2 \sin^2 \theta - 1$$

$$\text{ب) } \frac{\tan \theta + \cot \theta}{\sin \theta \cos \theta} = \frac{\tan \theta}{\cos \theta} + \frac{\cot \theta}{\sin \theta} = \frac{\sin \theta}{\cos^2 \theta} + \frac{\cos \theta}{\sin^2 \theta} = \tan^2 \theta + \frac{1}{\tan^2 \theta} = \tan^2 \theta + \frac{1}{\tan^2 \theta}$$

$$\text{الف) } x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \quad \text{معلوم} \Rightarrow \quad (17)$$

$$2x^2 - 2x - 2 = 0 \Rightarrow x_1, x_2 = \frac{2 \pm \sqrt{4 - 2(-2)}}{2} = \frac{2 \pm \sqrt{4+4}}{2} = \frac{2 \pm 2\sqrt{2}}{2} = \begin{cases} \frac{2+\sqrt{2}}{2} = \frac{\cdot}{\cdot} \\ \frac{2-\sqrt{2}}{2} = \frac{-1}{\cdot} \end{cases}$$

$$\text{ب) } (x+1)^2 - x^2 = 1 \Rightarrow x^2 + 2x + 1 - x^2 = 1 \Rightarrow 2x + 1 = 1 \Rightarrow 2x = 0 \Rightarrow x = 0$$