

1.3^u u^w

$$(x-1)(y) = x + x^y \Rightarrow$$

$$\begin{array}{r} x^y + x^y \\ -x^y + x^y \\ \hline yx^y \\ -yx^y + yx \\ \hline yx \\ -yx + y \\ \hline y \end{array}$$

(g) (d) (g)

$$y = x^y + 1 \Rightarrow x - 1 = x^y - 1$$

باريسا استنباط

نیزه 3

$$\frac{ax^y + bx^y + 1}{ax^y + (b-a)}$$

نیزه 4

$$\frac{(b-a)x^y + 1}{(b-a)x^y + (b-a)}$$

$$(b-a)+1 \Rightarrow \dots$$

$$x^y + ax + yb \rightarrow x^y + ax + ya \dots$$

$$\begin{array}{r} x^y + 1 \\ -x^y - yx \\ \hline yx + 1 \\ -yx - y \\ \hline 1 - y \end{array}$$

$$\Rightarrow \dots$$

$$x^y + (m-1)x^y + ymx + y \dots$$

$$\frac{yx-1}{y} \dots$$

نیزه 5

$$(m-\frac{1}{y})x^y + ymx + y \dots$$

$$\frac{1-m-1}{y} x + \frac{1-m-1}{y} \dots$$

$$\Rightarrow \frac{1-m-1}{y} = -y \dots$$

$$f(x) = x(x-1)(x+1) + \dots \Rightarrow f(0) = 1$$

$$\Rightarrow x=1 \Rightarrow f(1) = \dots$$

$$f(x) = x(x-1) + ax + b \Rightarrow \dots$$

$$\Rightarrow ya + b = \dots$$

$$(x^y - 1) + y = x^y + yx + 1 \Rightarrow x^y = x - 1 \dots$$

$$\Rightarrow x(x^y - 1) + y = \dots$$

$$\Rightarrow -x^y + yx - 1 + yx - 1 \dots$$

$$(x^r - x - r)(y) = ax^r + a^r + bx + f \Rightarrow x^r = x + r \Rightarrow (x)(x+r) + a(x+r) + bx + f = 0$$

$$\Rightarrow x^r + rx + ax + ra + bx + f = 0 \Rightarrow x + r + rx + ax + ra + bx + f = 0$$

$$\Rightarrow x(a+b+r) + (ra+a) = 0 \Rightarrow a+b+r = 0 \Rightarrow a+b = -r$$

$$x^0 + r^r$$

$$x^r + f$$

$$x = -r$$

$$\Rightarrow (x^r + f)(y) + R = x^0 + r^r \Rightarrow x^r = -f \Rightarrow R = (-f)(-f)x + r^r$$

$$\Rightarrow R = 19x + r^r \Rightarrow R = -f^2 + r^r = -19 \Rightarrow (9+f)(y) - 19 = -211$$

$$\Rightarrow 19y = 190 \Rightarrow y = -10$$

$$f(x) = mx^m + (r^m - r^n)x^r - f^m x - 1^r$$

$$x^r + \omega x + f$$

$$\Rightarrow x = -\omega x - f \Rightarrow m(x)(-\omega x - f) + (r^m - r^n)(-\omega x - f) - f^m x - 1^r = 0$$

$$\Rightarrow m(-\omega x^2 - fx) + (r^m - r^n)(-\omega x - f) - f^m x - 1^r = 0$$

$$\Rightarrow 19m x + 19m - 10m x - 10m + 10n x + 19n - f^m x - 1^r = 0 \Rightarrow x(9m + 9n) + (19m + 19n - 1^r) = 0$$

$$\Rightarrow \begin{cases} 9m + 9n = 0 \\ 19m + 19n - 1^r = 0 \end{cases} \Rightarrow \begin{cases} m + n = 0 \\ m + n = 1 \end{cases} \Rightarrow m = 1, n = -1$$

$$(x+r)(x-a) - 1 = x^r - fx + b \Rightarrow x^r - ax + rx - ra - 1 = x^r - fx + b$$

$$\Rightarrow x(-a+r) - (ra+1) = -fx + b \Rightarrow \begin{cases} -a+r = -f \\ ra+1 = b \end{cases} \Rightarrow \begin{cases} a = r-f \\ b = r^2 - b \end{cases} \Rightarrow a+b = r-f - r^2 + b = -r^2 - f$$

$$(x-r) = 0 \Rightarrow x = r \Rightarrow f(r) = -r$$

$$(x-1) = 0 \Rightarrow x = 1 \Rightarrow f(r-1) + x f(1+r) \Rightarrow f(r) + x f(r) \Rightarrow -r - r^2 x$$

$$x^r + \omega = rx^m + \omega x^r - x^r + r^r = (x^r - x)(y) + R \Rightarrow x - r + \omega x + r = R$$

$$\Rightarrow R = 4$$

$$x+1)(y)+0 = ax^r + bx^m + x+r \Rightarrow a-b+1=0 \Rightarrow a-b=-1$$

$$x-1)(y)+(r) = ax^r + bx^m + x+r \Rightarrow a+b=-a$$

$$(x) \cdot (x^r - \omega x) = x + \omega$$

$$(x) \cdot (x^r - \omega x) = x(x + \omega)$$

$$\Rightarrow \alpha^r + \omega x \Rightarrow \frac{\alpha^r + \omega x}{1} \Rightarrow R = \omega x$$

۱۴- $a^n - b^n$ همواره بر $a+b$ بخش پذیر است به شرطی که n زوج باشد ← گزینیه ۲ غلط است

۱۵- گزینیه ۳

$$\frac{\frac{x^m}{x^r} + \frac{x^r}{x^r}y - rx - y}{x^r - r} \Rightarrow R = y$$

$$\frac{-rx - y}{rx + ry}$$

$$(x+1)(y) + R = x(x^m - rx^r + ax + b) \Rightarrow 1 + m + a - b = 0 \Rightarrow b - a = 1$$

$$(x-1)(y) + R = x(x^m - rx^r + ax + b) \Rightarrow 1 - r + a + rb = 0 \Rightarrow ra + b = r$$

$$\Rightarrow 3b = 1$$

$$\Rightarrow b = \frac{1}{3}$$

$$\Rightarrow a = \frac{2}{3}$$

$$x(x-1)(x+1) + R = f(x) \Rightarrow f(1) = 1$$

$$\Rightarrow f(-1) = -1$$

$$\Rightarrow f(0) = 1$$

$$(x-1)(x+1) + R = f(x) \Rightarrow f(1) = ra + b = 1$$

$$\Rightarrow f(-1) = -ra + b = -1$$

$$\Rightarrow ra + b = 1$$

$$\Rightarrow -ra + b = -1$$

$$\Rightarrow a + b = 0 \Rightarrow b = -a$$

$$\Rightarrow a = 1$$

$$\Rightarrow a + b = 1 + 0 = 1$$

$$1 + x + x^2 + \dots + x^9 = (1 + x + x^2 + \dots + x^9) + x^1(1 + x + x^2 + \dots + x^9) + \dots + x^9(1 + x + x^2 + \dots + x^9)$$

$$\Rightarrow (1 + x + x^2 + \dots + x^9)(1 + x + x^2 + \dots + x^9) \Rightarrow$$

$$(ra - rb)^2 = (ra^3 - rvb^3 - 3ra^2b + 3ra^2b)^2 = 9fa^4 + 9rvb^4 + 1296a^4b^2 + 2916a^2b^4$$

$$\Rightarrow 19ff a^2b^4 + \dots \Rightarrow 1890 a^2b^4$$

$$2x^2 - 3x + 1)^2 \Rightarrow (2x^2 - 3x + 1)^2 = 0^2 = 0$$

۲۵ - نرسیده

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

۲۱ - نرسیده

$$\Rightarrow (2x+3) \left((x^2 + 4x + 4) - (x^2 + 2x + 1) \right) = (2x+3)(2x+3)$$

$$\Rightarrow (2x+3) \left((x^2 + 4x + 4) - (x^2 + 2x + 1) \right) = (2x+3)(2x+3)$$

$$(2x^2 + 9x + 9) - (x^2 + 2x + 1) = (2x^2 + 9x + 9) - (x^2 + 2x + 1)$$

$$(2x^2 + 9x + 9) - (x^2 + 2x + 1) = (2x^2 + 9x + 9) - (x^2 + 2x + 1)$$

$$\Rightarrow 2x^2 + 9x + 9 - x^2 - 2x - 1 = x^2 + 7x + 8 = (x+1)(x+8)$$

$$(2x+3)(x^2 + 7x + 8) = 2x^3 + 14x^2 + 16x + 3x^2 + 21x + 24 = 2x^3 + 17x^2 + 47x + 24$$

$$+ (2x+3) = 2x^3 + 17x^2 + 47x + 24 + 2x + 3 = 2x^3 + 17x^2 + 49x + 27$$

۶

$$1 - \frac{x}{y} \Big|^\Delta = (1 - x + \frac{x^2}{y})^\Delta = (1 + x^2 + \frac{x^2}{y} - 2x + \frac{x^2}{y} - \frac{x^2}{y})^\Delta$$

گزینه ۱ - ۲۳

$$\left(\frac{x^2}{y} - \frac{x^2}{y} + \frac{2x^2}{y} - 2x + 1 \right) \left(\frac{x^2}{y} - \frac{x^2}{y} + \frac{2x^2}{y} - 2x + 1 \right) = -\frac{x}{y} - 2x^2 - 2x^2 - \frac{x}{y} = -2x^2 - \frac{2x}{y}$$

گزینه ۲ - ۲۳

$$\left(1 - \frac{y}{x} \right)^\Delta = \left(1 + \frac{y}{x^2} - \frac{y}{x} \right) \times \left(1 - \frac{1}{x^2} - \frac{y}{x} + \frac{y^2}{x^2} \right) = \frac{1}{x^2} - \frac{2y}{x^2} - \frac{y^2}{x^2} = \frac{1-y^2}{x^2}$$

گزینه ۳ - ۲۳

$$(2x+1)^\Delta + (x+3)^\Delta = \Delta \text{ اولی} + \Delta \text{ دومی} = \Delta \text{ اولی} + \Delta \text{ دومی}$$

گزینه ۴ - ۲۴

$$x^2 + 9x + 2 \Rightarrow (2x + \frac{2}{x})^\Delta = 2x^2 + 9x + \frac{2}{x} \Rightarrow \text{با } \frac{1}{x} \text{ ضربه شود}$$

گزینه ۱ - ۲۵

$$2x^2 - x = a(x-2) + b(x-2)^2 + c(x-2)^3 \Rightarrow -x^2(x-2) = (x-2)(a + b(x-2) + c(x-2)^2)$$

$$\Rightarrow -x^2 = a + bx - 2b + cx^2 + 2c - 2cx \Rightarrow c = -1$$

$$b - 2c = 0 \Rightarrow b + 2 = 0 \Rightarrow b = -2$$

گزینه ۲

$$(a+1)(a-1)(a^2+d) = (a^2-1)(a^2+d) = a^4 + da^2 - a^2 - d$$

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$$a^2 + b^2 = 20 \Rightarrow (a+b)(a^2+b^2-ab) = 20 \times 10 \Rightarrow a^2 + b^2 - ab = 10$$

$$a + b = 20$$

$$(a-b)^2 + ab = a^2 + b^2 - ab$$

گزینه ۳

$$c^2 + d^2 + cd = 17 \Rightarrow (c+d)^2 - cd = 17 \Rightarrow 9 - cd = 17 \Rightarrow cd = -2$$

$$c+d = 4$$

$$\Rightarrow (c-d)^2 = \underbrace{c^2 + d^2}_9 - \underbrace{2cd}_{-4} = 13$$

گزینه ۴ - ۲۶

$$x^2 - 4x = x(x-4) \Rightarrow (1+\sqrt{3})(-2+\sqrt{3}) = 3 - 4 = -1$$

$$x = 2 + \sqrt{3}$$

گزینه ۵ - ۲۷

$$x^r - ry - rxy = x - rxy + y - ry = (x-y) - ry = (x-y)(1+ry) \quad \text{كثيره ١٣٢}$$

$$= (x-ry)(x+y) = x^2 - ryx + xy - ry^2 = (x-y)(x+y) = x^2 - ryx + xy - ry^2$$

$$\left. \begin{aligned} x = r(y+1) \\ y = r(x+1) \end{aligned} \right\} \Rightarrow (ry+r)(ry+r) = r^2 \Rightarrow ry = r \Rightarrow y = 1$$

$$\Rightarrow x = r$$

$$x^r + y^r + z^r = x + y + z \Rightarrow x^r + y^r - rxy + x^r + z^r - rxz + y^r + z^r - ryz = 0$$

$$\Rightarrow (x-y)^r + (x-z)^r + (y-z)^r = 0 \Rightarrow x = y = z$$

$$\Rightarrow \frac{(x-y)(y-z)(z-x)}{3} = 0 = 0$$

$$r(x-r)^r + r(ry+1)^r = -(z-0)^r \Rightarrow r(x-r)^r + r(ry+1)^r + (z-0)^r = 0 \Rightarrow \left. \begin{aligned} x = r \\ y = -\frac{1}{r} \\ z = 0 \end{aligned} \right\}$$

$$\Rightarrow x^r y^r z = r^r x (-\frac{1}{r})^r \cdot 0 = -1$$

$$\frac{x}{a} + \frac{y}{b} + \frac{z}{c} = 1 \xrightarrow{\text{ضرب}} \frac{x^r}{a^r} + \frac{y^r}{b^r} + \frac{z^r}{c^r} + \frac{rx}{ab} + \frac{ry}{ac} + \frac{rz}{bc} = 1 \Rightarrow \frac{x^r}{a^r} + \frac{y^r}{b^r} + \frac{z^r}{c^r} = 1$$

$$\frac{y}{a} + \frac{b}{r} + \frac{c}{z} = 0 \Rightarrow \frac{yza + yzb + yzc}{xyz} = 0 \Rightarrow yzc + yzb + yza = 0 \Rightarrow \frac{x^r}{a^r} + \frac{y^r}{b^r} + \frac{z^r}{c^r} = 1$$

$$\frac{x^r}{(x+1)^r} \xrightarrow{\text{ضرب}} \frac{x}{(x+1)^r} \xrightarrow{\text{ضرب}} \frac{x^r + rx + 1}{x} = x + r + \frac{1}{x}$$

$$\left. \begin{aligned} r + r = 0 \\ x + \frac{1}{x} = r \end{aligned} \right\} \Rightarrow r = 0 \Rightarrow \frac{1}{0} \xrightarrow{\text{ضرب}} \frac{1}{r}$$

$$x^r + rb^r + 1 = r(a+b) \Rightarrow (a^r - fa + f) + (fb^r - fb + 1) = 0 \Rightarrow (a-r)^r + (rb-1)^r = 0$$

$$\Rightarrow a = r, b = \frac{1}{r} \Rightarrow a + b = r + \frac{1}{r} = \frac{a}{r}$$

$$A(x+B)(x-1) + C(x^r+f) = rx^r + rx + 1 \Rightarrow Ax^r + Bx - Ax - B + Cx^r + C = rx^r + rx + 1$$

$$\Rightarrow (A+C)x^r + (B-A)x + (C-B) = rx^r + rx + 1 \Rightarrow \left. \begin{aligned} A+C = r \\ B-A = r \\ C-B = 1 \end{aligned} \right\} \Rightarrow B+C = 0$$

$$\Rightarrow A-B = 0, r = -r$$

$$\left. \begin{aligned} A = 0 \\ B = 0 \\ C = 1 \end{aligned} \right\}$$

$$-y = b^y + 1 \Rightarrow \frac{b^y - a^y + 1}{a^y b^y} \Rightarrow \frac{y(b^y + 1)b^y}{y b^y + y b^y} = -1$$

۲ - کریمه - ۴۵

$$x^y + x + 1 = 0 \xrightarrow{\div x} x + \frac{1}{x} = -1 \xrightarrow{y \text{ ضرب}} x^y + \frac{1}{x^y} + y = 1 \Rightarrow x^y + \frac{1}{x^y} = -1$$

۳ - کریمه - ۴۶

$$\Rightarrow \text{در } x^0 \text{ ضرب} \rightarrow x^0 + \frac{1}{x^0} = -1$$

$$fx^y + y^f + z^y + fx + y^y - yz + y = 0 \Rightarrow (fx^y + fx + 1) + (y^f + y^y + 1) + (z^y - yz + 1) = 0$$

$$\Rightarrow (yx + 1)^y + (y^y + 1)^y + (z - 1)^y = 0 \Rightarrow x = -\frac{1}{y}, y = -\frac{1}{y}, z = 1 \Rightarrow xyz = \frac{1}{y}$$

گزینه ۱ - ۵۲

$$A(x+B)(x+1) + C(x^y+1) = x^y + yx + y \Rightarrow Ax^y + Bx + Ax + B + Cx^y + C = x^y + yx + y$$

$$\Rightarrow (A+C)x^y + (A+B)x + (B+C) = x^y + yx + y \Rightarrow \begin{cases} A+C=1 \\ A+B=y \\ B+C=y \end{cases} \Rightarrow \begin{cases} A=0 \\ B=y \\ C=1 \end{cases} \Rightarrow A+B+C=y$$

گزینه ۴ - ۴۳

$$(x^y + x^f y + y^f + 1)^y - (x^y - x^f y + y^f)^y \Rightarrow \sqrt{x^y y} \leq 10^8$$

گزینه ۳ - ۴۴

$$\left. \begin{aligned} (x+1)^y - yx(x+1) \\ a^y + b^y = (a+b)^y - yab(a+b) \end{aligned} \right\} \Rightarrow x^y + 1$$

گزینه ۲ - ۴۵

$$\frac{x^y}{x^y+1} = \frac{1}{y} \xrightarrow{\text{مکسر}} \frac{x^y+1}{x^y} = y \Rightarrow x^y + \frac{1}{x^y} = y \Rightarrow x^y + \frac{1}{x^y} + y = 9 \Rightarrow x + \frac{1}{x} = 3$$

$$\Rightarrow x^y + \frac{1}{x^y} = (x + \frac{1}{x})^y - y(x + \frac{1}{x}) \Rightarrow 2y - 9 = 18$$

گزینه ۴ - ۴۶

$$a(a-y)(a-f) - y^2a + y^2f \Rightarrow a(a-y)(a-f) - y^2(a-y) \Rightarrow (a-y)(a^2 - fa - y^2)$$

$$\Rightarrow (a-y)(a-f)(a+y) \rightarrow$$

گزینه ۳

$$(x^y + yx^y - f) \Rightarrow (x^y - 1)(x^y + f) \Rightarrow (x^y + f)(x+1)(x-1) \rightarrow$$

گزینه ۳

$$N(K+\omega) - x^y(K+\omega) \Rightarrow (K+\omega)(y - x^y) \Rightarrow (K+\omega)(y-x)(9+yx+x^y)$$

گزینه ۱ - ۴۹

$$\begin{aligned} x^y + x - y &\Rightarrow (x+y)(x-1) \\ x^y - x - y &\Rightarrow (x-y)(x+1) \end{aligned} \Rightarrow (x+y)(x-y)(x-1)(x+1) = (x^y - f)(x^y - 1)$$

گزینه ۱ - ۵۰

$$x^f - yx^y + \lambda x - yf \Rightarrow x^f + \lambda x - yx^y - yf \Rightarrow x(x^y + \lambda) - y(x^y + \lambda)$$

$$\Rightarrow (x^y + \lambda)(x - y) \Rightarrow (x+y)(x^y - yx + f)(x - y) \rightarrow$$

گزینه ۳

$$y - y^2 - 1 + y \Rightarrow y^2(1-y) = (1-y) \Rightarrow y^2 = 1 \Rightarrow y = \pm 1$$

$$x^2 + 2x - x - 2 \Rightarrow x^2(x+1) - (x+2) \Rightarrow (x+2)(x^2-1) \Rightarrow (x+2)(x-1)(x+1)$$

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

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

$$x^2 - 2x^2 + 2 = 0 \Rightarrow (x^2-1)(x^2-2) = 0 \Rightarrow (x-1)(x+1)(x^2-2) \Rightarrow$$

$$\begin{cases} x_1 = 1 \\ x_2 = -1 \\ x_3 = \sqrt{2} \\ x_4 = -\sqrt{2} \end{cases} \Rightarrow 1 - 1 + \sqrt{2} - \sqrt{2} = 0$$

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

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

$$(x+1)^2 + 1 \Rightarrow (x+1+1)(x+1+1) = (x+2)(x+2) = (x+2)^2$$

$$x^2 + 2x + 1 \Rightarrow (x+1)^2$$

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

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

$$y^2 - 2y^2 + 1 = (y^2 - 2y^2 - 1)(z) \Rightarrow z = y^2 - 2y^2 - 1$$

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

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

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

$$\frac{1}{x-2} - \frac{1}{x+1} - \frac{f}{(x-2)(x+2)} = \frac{x+1 - (x-2) - f}{(x-2)(x+2)} = 0$$

$$x^2 + (x-2)(y+1) - 2xy \Rightarrow x(x-2) + (x-2)(y+1) \Rightarrow (x-2)(x+y+1)$$

۶۱ - فرضیه ۳
۶۲ - فرضیه ۲

$$x^2 y^2 - 2x^2 y + 2x^2 + 2y^2 - 2y + 1 \Rightarrow x^2 (y^2 - 2y + 2) + 2(y^2 - 2y + 1)$$

$$= (y^2 - 2y + 2)(x^2 + 2) \rightarrow \left. \begin{array}{l} x^2 + 2 \rightarrow \text{کثیرالمتغایر} \rightarrow x \leq 0 \rightarrow [2, +\infty) \\ y^2 - 2y + 2 \rightarrow y = 1 \Rightarrow 1 - 2 + 2 = 1 \end{array} \right\} \Rightarrow f(x,y) = 12$$

$$-v x^r + p x = x(x^r - v x + p) = x(x-1)(x-p) \quad \text{مکتوبه ۳} = ۶۳$$

$$\frac{x+p}{x^r-1} = \frac{A}{x} + \frac{B}{x-1} + \frac{C}{x+1} \Rightarrow Ax^r - A + Bx^r + Bx + Cx^r - Cx = vx + p \quad - ۶۴$$

$$(A+B+C)x^r + (B-C)x - A = vx + p \Rightarrow -A = p \Rightarrow A = -p$$

$$x^r - x + (x-1)(y+1) = x(x-1) + (x-1)(y+1) = (x-1)(x+y+1) \quad \text{مکتوبه ۳} = ۶۵$$

$$x^r - b^r + c^r - rac = (a^r + rac + c^r) - b^r \Rightarrow (a-c)^r - b^r = (a-c-b)(a+c+b) \quad - ۶۶$$

$$y + x^r + \omega = (x^r + ax^r + \omega)(z) \Rightarrow z = x^r + 1 \Rightarrow x^r + ax^r + \omega x^r + x^r + ax^r + \omega$$

$$x^r + (a+1)x^r + (a+\omega)x^r + \omega \Rightarrow \left. \begin{matrix} a+\omega = r \\ a+1 = 0 \end{matrix} \right\} \Rightarrow a = -1$$

$$\left. \begin{matrix} A = x - \frac{1}{x} = \frac{x^r-1}{x} \\ B = \frac{x-1+1}{x^r-1} = \frac{x}{x^r-1} \end{matrix} \right\} \Rightarrow A \times B = \frac{x^r-1}{x} \times \frac{x}{x^r-1} = 1 \quad \text{مکتوبه ۲} = ۶۸$$

$$x - r + \frac{\omega}{(x+r)} = \frac{(x+1)}{(x^r+r)} \Rightarrow \frac{x^r + rx - rx - r + \omega}{(x+r)} \times \frac{x(x+r)}{(x+1)} = x^r - rx - r \times \frac{x}{x+1} \quad - ۶۹$$

$$(x-r)(x+1) \times \frac{x}{(x+1)} = x^r - rx$$

$$\frac{ry^r - ry^r - ry + 1}{(1-ry)^r} \times \frac{y^r}{1+ry} \Rightarrow \frac{(ry-1)^r (ry+1)}{(1-ry)^r} \times \frac{y^r}{(1+ry)} = y^r \quad \text{مکتوبه ۳} = ۷۰$$

$$ry^r - ry^r - ry + 1 = ry(ry^r - 1) - (ry^r - 1) = (ry^r - 1)(ry - 1) = (ry+1)(ry-1)(ry-1) = (ry+1)(ry-1)^2$$

$$\frac{k - \frac{\omega k - r}{k}}{k} = \frac{\frac{k^r - \omega k + r}{k}}{k} \Rightarrow \frac{(k-r)(k-y)}{k} = k^r - rk \quad - ۷۱$$

$$= \frac{1}{x^r - rx + r} + \frac{1}{x^r - r} - \frac{1}{x^r - x - r} - \frac{1}{x^r - rx^r - x + r}$$

$$= \frac{1}{(x-1)(x-r)} + \frac{1}{(x-r)(x+r)} - \frac{r}{(x-r)(x+1)} - \frac{1}{(x-1)(x+1)(x-r)}$$

$$x^r - rx^r - x + r = x(x^r - 1) - r(x^r - 1) = (x^r - 1)(x - r) = (x-1)(x+1)(x-r)$$

$$A = \frac{(x+1)(x+r) + (x-1)(x-r) - (x+r)(x-1) - (x+r)}{(x-1)(x+1)(x-r)(x+r)} = \frac{x^r + \cancel{rx} + \cancel{r} - \cancel{rx} - \cancel{r} + \cancel{x} - \cancel{r} - \cancel{x} - \cancel{r}}{(x-1)(x+1)(x-r)(x+r)}$$

$$\frac{x^r}{(x-1)(x+1)(x-r)(x+r)}$$

$$(Ym-1)x + Y - Ym = 0 \Rightarrow S=0 \Rightarrow Ym-1=0 \Rightarrow m=Y \Rightarrow x^Y - 0x - Y = 0$$

۳ - ضربیه

$$\frac{1}{XY} = \frac{x_1 + x_2}{x_1 x_2} \Rightarrow \frac{S}{P} = \frac{0}{-Y} = -\frac{0}{Y}$$

$$x + Yx - 0 = 0 \Rightarrow x + Yx - 0 + 10 = 0 + 1 \Rightarrow x + Yx + 0 = 10 \quad (1)$$

۴ - ضربیه

$$Y + Yx + 0 (Y + Yx + 0) \Rightarrow 1 \cdot x \cdot 1 \cdot 1 \dots$$

$$x_1 = -1, x_2 = \frac{1}{Y} \Rightarrow S = -1 + \frac{1}{Y} = -\frac{1}{Y} \Rightarrow x^Y + \frac{1}{Y}x - \frac{1}{Y} = 0 \Rightarrow Yx^Y + x - 1 = 0$$

۵ - ضربیه

$$(x+1)^Y - (x+m) = 0 \Rightarrow f x^Y + f x + 1 - x - m = 0 \Rightarrow f x^Y + Yx + 1 - m = 0$$

۶ - ضربیه

$$\Delta = 0 \Rightarrow 9 = 16 + 16m = 0 \Rightarrow 16m = -7 \Rightarrow m = -\frac{7}{16}$$

$$f \cdot 16x^Y + 9 = 0 \Rightarrow fA^Y - 16A + 9 = 0 \Rightarrow A = \frac{16 \pm \sqrt{16^2 - 144f}}{2} \Rightarrow A_1 = \frac{16}{2} = \frac{9}{f} \Rightarrow A_2 = 1$$

۷ - ضربیه

$$x^Y = \frac{9}{f} \Rightarrow x = \pm \sqrt[3]{\frac{9}{f}}$$

$$x^Y = 1 \Rightarrow x = \pm 1$$

$$a^Y + B^Y = 0 \Rightarrow a = \pm 1 \text{ و } B = \pm Y$$

۸ - ضربیه

$$Yx^Y + (m-1)x - f = 0 \Rightarrow a = 1 \Rightarrow Y + (m-1) - f = 0 \Rightarrow m = \frac{f-Y}{Y}$$

$$\Rightarrow a = -1 \Rightarrow Y - f = m - 1 \Rightarrow m = Y - f + 1$$

$$0^Y + 1^Y - Y(x^Y + 1) + 1Y = 0 \Rightarrow A^Y - YA + 1Y = 0 \Rightarrow (A-Y)(A-f) = 0 \Rightarrow A = Y \text{ یا } f$$

۹ - ضربیه

$$A = Y \Rightarrow x^Y + 1 = Y \Rightarrow x^Y = Y - 1 \Rightarrow x = \pm \sqrt[3]{Y-1}$$

$$A = f \Rightarrow x^Y + 1 = f \Rightarrow x^Y = f - 1 \Rightarrow x = \pm \sqrt[3]{f-1}$$

$$Y = Yx - f \Rightarrow x = Y$$

۱۰ - ضربیه

$$Y = (m+Y)x^Y + m \Rightarrow 0 = f(m+Y) + Ym \Rightarrow fms - 1Y \Rightarrow ms = \frac{Y}{f}$$

$$x^2 - \gamma \cdot x + \gamma \gamma = 0 \Rightarrow (x - \gamma)(x - \gamma) = 0 \Rightarrow x = \gamma \perp \gamma$$

تجزیه - ۱۱

$$\sqrt{x} + \sqrt{x\gamma} = \sqrt{\gamma} + \sqrt{\gamma} = \gamma + \gamma \leq \gamma$$

$$y = x^2 + ax + 1 \Rightarrow \Delta = \frac{b^2}{4a} \Rightarrow \frac{-a}{2} \Rightarrow a = \gamma$$

تجزیه - ۱۲

$$mx^2 - x + m^2 = \gamma \Rightarrow mx^2 - x + m^2 - \gamma = 0$$

$$\Rightarrow x^2 - \frac{x}{m} + \frac{m^2 - \gamma}{m} = 0 \Rightarrow \frac{m^2 - \gamma}{m} \leq 1$$

- ۱۳

$$x_1 \cdot x_2 \leq 1 \Rightarrow p \leq 1$$

تجزیه ۱

$$\Rightarrow m^2 - \gamma \leq m \Rightarrow m^2 - m - \gamma = 0 \Rightarrow (m - \gamma)(m + 1) = 0 \Rightarrow m = \gamma - 1$$

- ۱۴

$$x^2 - \gamma x + \gamma^2 = 0 \Rightarrow (x - \gamma)(x - \gamma) = 0 \Rightarrow x = \gamma \perp \gamma$$

نیزه - ۸۱

$$\sqrt{x} + \sqrt{x\gamma} = \sqrt{\gamma} + \sqrt{\gamma} = \gamma + \gamma \leq \gamma$$

$$y = x^2 + ax + 1 \Rightarrow \text{شکل } \frac{-b}{2a} \Rightarrow \frac{-a}{2} \Rightarrow x = \gamma$$

نیزه - ۸۲

$$mx^2 - x + m^2 = \gamma \Rightarrow mx^2 - x + m^2 - \gamma = 0$$

$$\Rightarrow x^2 - \frac{x}{m} + \frac{m^2 - \gamma}{m} = 0 \Rightarrow \frac{m^2 - \gamma}{m} \leq 1$$

- ۸۳

$$x_1 x_2 \leq 1 \Rightarrow p \leq 1$$

نیزه ۱

$$\Rightarrow m^2 - \gamma \leq m \Rightarrow m^2 - m - \gamma = 0 \Rightarrow (m - \gamma)(m + 1) = 0 \Rightarrow m + \gamma = 1$$

- ۸۴

$$2x^2 - \omega x + 1 = 0 \Rightarrow x = \frac{\omega \pm \sqrt{\omega^2 - 4}}{2} \Rightarrow x' = \frac{-\omega \pm \sqrt{\omega^2 - 4}}{2} \Rightarrow S = \frac{-\omega + \sqrt{\omega^2 - 4}}{2} + \frac{-\omega - \sqrt{\omega^2 - 4}}{2} = -\frac{\omega}{1} = -\omega$$

$$\Rightarrow P = \left(\frac{-\omega + \sqrt{\omega^2 - 4}}{2} \right) \left(\frac{-\omega - \sqrt{\omega^2 - 4}}{2} \right) = \frac{\omega^2 - (\omega^2 - 4)}{4} = \frac{4 - \omega^2}{4} = \frac{1 - \omega^2}{1}$$

$$\omega x^2 + \gamma x + k = 0 \Rightarrow x' + \frac{\gamma}{\omega} x + \frac{k}{\omega} = 0 \Rightarrow S = x_1 + x_2 \quad \left. \begin{array}{l} \Rightarrow S = -\frac{\gamma}{\omega} \\ \Rightarrow x_1 = \frac{\gamma}{\omega} \end{array} \right\} \Rightarrow P = \frac{k}{\omega} = -\frac{\gamma}{\omega} \times \left(-\frac{1}{\omega}\right) = \frac{\gamma}{\omega^2} \Rightarrow \gamma \omega k = 1 \Rightarrow k = \frac{\gamma}{\omega}$$

$$x_1 \sqrt{x_2} + x_2 \sqrt{x_1} \xrightarrow{\text{توليد}} x_1^2 x_2 + x_2^2 x_1 + 2x_1 x_2 \sqrt{x_1 x_2} \Rightarrow x_1 x_2 (x_1 + x_2 + 2\sqrt{x_1 x_2})$$

$$\Rightarrow P(S + 2\sqrt{P}) = 1(\gamma + 2\sqrt{1}) = \omega$$

$$3x^2 - 7x + 1 = 0 \Rightarrow x = \frac{7 \pm \sqrt{49 - 12}}{6} \Rightarrow x' = \frac{13 \pm \sqrt{37}}{6} \Rightarrow S = \frac{13 + \sqrt{37}}{6} + \frac{13 - \sqrt{37}}{6} = \frac{26}{6} = \frac{13}{3}$$

$$\Rightarrow P = \frac{13^2 - 37}{36} = \frac{133}{36} = \frac{33}{9} = \frac{11}{3}$$

$$y = -\frac{1}{\gamma} x^2 + x + \frac{\gamma}{\gamma} \Rightarrow \text{ش } = \frac{-b}{2a} = \frac{-1}{-1} = 1 \Rightarrow A = \left[\frac{1}{\gamma} \right]$$

$$\Rightarrow y = -\frac{1}{\gamma} + 1 + \frac{\gamma}{\gamma} = \gamma$$

$$x^2 - 2x - 1 = 0 \rightarrow x = \frac{2 \pm \sqrt{4 + 4}}{2} = 1 \pm \sqrt{2} \xrightarrow{\text{مكسوس}} \frac{1}{1 \pm \sqrt{2}} \Rightarrow x_1 = \frac{1}{1 + \sqrt{2}} \times \frac{(1 - \sqrt{2})}{(1 - \sqrt{2})} = \sqrt{2} - 1$$

$$\Rightarrow x_2 = \frac{1}{1 - \sqrt{2}} \times \frac{(1 + \sqrt{2})}{(1 + \sqrt{2})} = -\sqrt{2} - 1$$

$$y = \left(\gamma - \frac{x}{m}\right)(mx - 1) = \gamma mx - \gamma - x^2 + \frac{x}{m} \Rightarrow -x^2 + \gamma mx + \frac{x}{m} - \gamma$$

$$\Delta = 0 \Rightarrow \left(\gamma m + \frac{1}{m}\right)^2 - 4\gamma = 0 \Rightarrow 9m^2 + \frac{1}{m^2} - 9 = 0$$

$$\Rightarrow 9m^4 - 9m^2 + 1 = 0 \Rightarrow$$

$$y = (x-1)(x-3) - x \Rightarrow y = x^2 - \omega x + \omega \Rightarrow \text{س} = \frac{-b}{2a} = \frac{\omega}{2}$$

۹۱ - کزنیه ۲

$$x_1 = (x_2 x_f) + 1 \Rightarrow s = x_1 + x_2 = \omega x_2 + 1$$

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$$p = -s - 1 \Rightarrow x_1 x_2 = -\omega x_2 - \omega - 1 \Rightarrow x_1 x_2 + \omega x_2 = -s \Rightarrow x_2(x_1 + \omega) = -s$$

$$\Rightarrow x_2(\omega x_2 + 1) = -s \Rightarrow \omega x_2^2 + s x_2 + s = 0$$

۹۳

$$\frac{B}{a-1} + \frac{a}{B-1} = \frac{B-B+a-a}{(a-1)(B-1)} \Rightarrow \frac{(a+B) - (a+b) - (a+b)}{ab - (a+b) + 1} \Rightarrow \frac{(s)' - 2P - s}{P - s + 1} = \frac{1s + f - f}{-2 - f + 1}$$

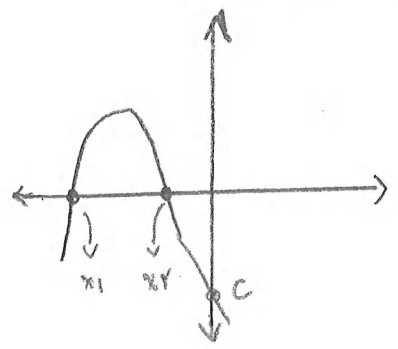
$$= -\frac{1f}{D}$$

گزینه ۳

$$f(x) = k(x^2 + 1) + px^2 - fx = kx^2 + k + px^2 - fx = (k+p)x^2 - fx + k$$

گزینه ۱ - ۹۴

$$\text{Max } x = 0 \Rightarrow a < 0 \Rightarrow k+p < 0 \Rightarrow k = -f$$



$$P(x) = ax^2 + bx + c$$

$$\downarrow \Rightarrow a < 0$$

$$\text{مسئله } f < 0 \Rightarrow c < 0$$

$$\text{مسئله } < 0 \Rightarrow \frac{-b}{2a} < 0 \Rightarrow b < 0$$

$$ax^2 + bx + c = 0 \Rightarrow \text{دو جواب دارد}$$

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$$f(x) = ax^2 + fx + d \quad \left. \begin{array}{l} \\ \text{Max } = 9 \end{array} \right\} \Rightarrow a < 0$$

$$\text{مسئله } = \frac{-b}{2a} = \frac{-f}{2a}$$

$$\Rightarrow ax \frac{1f}{fa^2} + fx \frac{-f}{2a} + d = \frac{f}{a} - \frac{f}{2a} + d = 9$$

$$\Rightarrow \frac{-f}{a} = f \Rightarrow a = -1 \Rightarrow \text{مسئله } = \frac{-f}{2a} = \frac{-f}{-2} = 2$$

گزینه ۲ - ۹۶

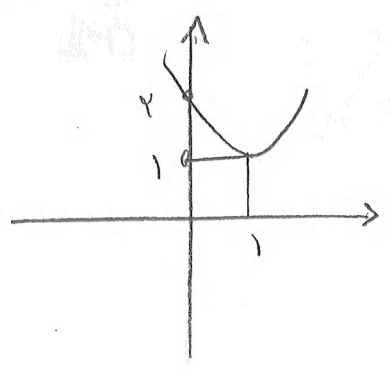
$$f = f$$

$$f(x) = x^2 + px + k$$

$$\Rightarrow f = 1 - 2 + k \Rightarrow k = 1$$

$$\text{مسئله } = \frac{-b}{2a} = \frac{-p}{2} = -1$$

گزینه ۴ - ۹۷



$$\text{مسئله } f = 2 \Rightarrow c = 2$$

$$A = |1|$$

$$\Rightarrow 1 = a + b + 2 \Rightarrow a + b = -1$$

$$d = ax^2 + bx + c$$

$$\Rightarrow a = -1 - b$$

$$\text{مسئله } = 1 = \frac{-b}{2a} \Rightarrow \frac{-b}{-2b-2} = 1 \Rightarrow -2b - 2 = -b \Rightarrow -b = 2$$

$$\Rightarrow b = -2$$

$$\Rightarrow b - c = -2 - 2 = -4$$

گزینه ۵ - ۹۸

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$$(x+1)^2 + (y-x)^2 = (x+y)^2 \Rightarrow x^2 + 2x + 1 + y^2 - 2xy + x^2 = x^2 + 2xy + y^2 \Rightarrow 4x^2 - 4xy - 1 = 0$$

$$x^2 - x - y \leq 0 \Rightarrow (x-y)(x+1) = 0 \Rightarrow x \leq y \text{ یا } -1 \rightarrow \text{حلول منفی} \Rightarrow x \leq y \text{ نمی شود}$$

$$\Rightarrow \text{مجموع} = (x+y) + (x+1) + yx = 2 + f + y = 12$$

فأما وجدنا
حقیقی

$$\Rightarrow \Delta < 0 \Rightarrow (m+1)^2 - f \left[\frac{1}{f} (m+y) \right] (y) < 0 \Rightarrow m^2 + 2m + 1 - fm - 1 < 0$$

$$\Rightarrow m^2 - fm < 0 \Rightarrow -f < m < f$$

- ۱۹

$$(x+1)^2 + (y-x)^2 = (x+y)^2 \Rightarrow x^2 + 2x + 1 + y^2 - 2xy + x^2 = x^2 + 2xy + y^2 \Rightarrow 4x^2 - 4xy - 1 = 0$$

$$x^2 - x - y \leq 0 \Rightarrow (x-y)(x+1) = 0 \Rightarrow x \leq y \text{ یا } x = -1 \rightarrow \text{حلول منفی} \Rightarrow x = y \text{ نمی شود}$$

گزینه ۳

$$\Rightarrow \text{مجموع} = (x+y) + (x+1) + yx = 0 + f + 1 = 1 \text{ یا } 12$$

فایده روش
حقیقی

$$\Rightarrow \Delta < 0 \Rightarrow (m+1)^2 - f \left[\frac{1}{f}(m+y) \right] (y) < 0 \Rightarrow m^2 + 2m + 1 - fm - 1 < 0$$

$$\Rightarrow m^2 - fm < 0 \Rightarrow -f < m < f$$

۱۰۰ - گزینه ۳