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$$ex A \left| \begin{array}{c} -1 \\ 9 \end{array} \right. \sim y = ax^2 + bx + c \quad B \left| \begin{array}{c} 1 \\ 1 \end{array} \right. \sim y = a(x+1)^2 + 9 \quad 1 = 14a + 9 \rightarrow 14a = -8 \rightarrow a = -\frac{4}{7}$$

$$y_2 = \frac{1}{7}(x+1)^2 + 9 = \left(\frac{x^2}{7} + \frac{x}{7} + \frac{1}{7}\right) + 9 = \frac{x^2}{7} + \frac{x}{7} + \frac{64}{7} = y_2$$

$$x^2 + mx + m + 4 = 0$$

$$\Delta = b^2 - 4ac = m^2 - 4(m+4) = m^2 - 4m - 16 > 0 \rightarrow (m-2)^2 - 20 > 0 \rightarrow (m-2)^2 > 20 \rightarrow m-2 > \sqrt{20} \rightarrow m > 2 + 2\sqrt{5}$$

$$\Delta > 0 \rightarrow m^2 - 4(m+4) = m^2 - 4m - 16 > 0 \rightarrow (m-2)^2 - 20 > 0 \rightarrow (m-2)^2 > 20 \rightarrow m-2 > \sqrt{20} \rightarrow m > 2 + 2\sqrt{5}$$

$$m > 2 + 2\sqrt{5}$$



$$x^2 + (m-1)x + m-4 = 0$$

$$\frac{-b}{a} = \frac{a}{c} \sim \frac{-(m-1)}{1} = \frac{m}{m-1} \quad (A > 0)$$

$$\frac{-b}{a} = \frac{-(m-1)}{1} = \frac{m}{m-1}$$

$$q = \frac{-(m-1)(m-1)}{1} = -(m-1)^2$$

$$m^2 - 4m - 16 = 0$$

$$m^2 - 4m - 16 = 0 \rightarrow (m-2)^2 - 20 = 0 \rightarrow m-2 = \pm \sqrt{20} \rightarrow m = 2 \pm 2\sqrt{5}$$

$$m = \frac{2 + 2\sqrt{5}}{2} \rightarrow \Delta = 14 - 4\left(\frac{2 + 2\sqrt{5}}{2}\right) = 14 - 4(1 + \sqrt{5}) = 14 - 4 - 4\sqrt{5} = 10 - 4\sqrt{5} > 0$$

$$m = \frac{2 - 2\sqrt{5}}{2}$$

$$x^2 - x - k = 0$$

$$\left(x_1^2 + \frac{1}{x_1} \right) = \left(x_2^2 + \frac{1}{x_2} \right)$$

$$x_1 + x_2 = 1 \quad / \quad x_1 - x_2 = -k \quad (x_1^2 = x_1 + k, x_2^2 = x_2 + k)$$

$$x_1^2 = x_1 + k \quad / \quad x_2^2 = x_2 + k \quad / \quad x_1^2 - x_2^2 = x_1 - x_2 \quad / \quad (x_1 + x_2)(x_1 - x_2) = x_1 - x_2 \quad / \quad (x_1 + x_2) = 1 \quad / \quad x_1 + x_2 = 1$$

$$x_1 = 0 \quad / \quad x_2 = 1 \quad / \quad 0 = 0 + k \quad / \quad k = 0$$

$$x_1 + x_2 = 1 \quad / \quad x_1^2 + x_2^2 = 1 + k \quad / \quad (x_1 + x_2)^2 = 1 + k \quad / \quad 1 = 1 + k \quad / \quad k = 0$$

$$\frac{1}{k} = \frac{x_1 + x_2}{x_1 x_2}$$

$$x_1 x_2 = \left(\frac{1}{k} \right) \left(\frac{1}{k} \right) = \frac{1}{k^2} \quad / \quad (x_1 + x_2)^2 = 1 + k \quad / \quad 1 = 1 + k \quad / \quad k = 0$$

$$x_1 = \frac{1 + \sqrt{1 + k}}{2} \quad / \quad x_2 = \frac{1 - \sqrt{1 + k}}{2} \quad / \quad x_1 x_2 = \frac{1 - (1 + k)}{4} = \frac{-k}{4}$$

$$x_1 = \frac{1 + \sqrt{1 + k}}{2} \quad / \quad x_2 = \frac{1 - \sqrt{1 + k}}{2}$$

$$x_1 + x_2 = 1$$

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

$$\left(x^{\frac{1}{2}} - x^{-\frac{1}{2}} - 2x^{\frac{1}{2}} = 0 \right) x^{\frac{1}{2}} \rightarrow x^{\frac{1}{2}} - 1 - 2x^{\frac{1}{2}} = 0 \rightarrow x^{\frac{1}{2}} - 2x^{\frac{1}{2}} - 1 = 0$$

$$\Delta = b^2 - 4ac = 4 - 4(-1)(1) = 8 \rightarrow x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{1 \pm \sqrt{2}}{2} \rightarrow x_1 = \frac{1 + \sqrt{2}}{2}, x_2 = \frac{1 - \sqrt{2}}{2}$$

$$x_1 + x_2 = \frac{1 + \sqrt{2}}{2} + \frac{1 - \sqrt{2}}{2} = 1 \quad / \quad \frac{-b}{a} = \frac{-(-2)}{1} = 2$$

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$$rx^r - ax + r = 0$$

$$\frac{-b}{a} = \frac{a}{r} (x_1 + x_2) \quad / \quad \frac{c}{a} = \frac{r}{r} (x_1 \cdot x_2) \quad / \quad x_1 = rx_2 \quad -y$$

$$rx_1 + x_2 = \frac{a}{r} \rightarrow rx_2 = \frac{a}{r} \rightarrow x_2 = \frac{a}{r^2}$$

$$rx_2 \cdot x_2 = \frac{r}{r} \rightarrow rx_2^2 = \frac{r}{r} \rightarrow x_2^2 = \frac{r}{r} \rightarrow x_2 = \pm \frac{r}{r} \quad / \quad \frac{r}{r} = \frac{a}{r^2} \rightarrow r = ra \rightarrow (a=1)$$

$$\frac{-r}{r} = \frac{a}{r^2} \rightarrow -r = ra \rightarrow a = -1$$

$$K|1 - (-1)| = 14 \Rightarrow$$



$$y = ax^r + (r + ra)x \quad (x_1 = x_2 = 1) \quad \rightarrow a > 0 \quad \Delta < 0$$

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$$\frac{-b}{a} > 0 \rightarrow \frac{-r - ra}{a} > 0 \quad / \quad \frac{-r}{-r + r} = 0 \Rightarrow \frac{r}{r} < 0 \Rightarrow \text{منه مقدار صفر ندارد}$$

$$-r - ra = 0 \rightarrow -r = ra \rightarrow a = -\frac{r}{r}$$

$$a = 0 \rightarrow y = rx \quad \text{و این هم جواب نیست}$$



$$y = x^r + rx - r \quad / \quad y = -x^r - rx + b \quad \rightarrow \frac{-a}{r} = \frac{r}{-r} \Rightarrow (a=r)$$

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$$x = 1, y = 1 \rightarrow y_1 = y_2 \rightarrow x^r + rx - r = -x^r - rx + b \rightarrow rx^r + rx - r = b$$

$$x^r + rx - r = 1 \rightarrow x^r + rx - r = 0 \rightarrow (x^r + rx = r)$$

$$r(x^r + rx - 1) = b \Rightarrow (b=r)$$



$$ab = rxr = \underline{1}$$

$$rx^r - ax + b = 0 \quad \left\{ \begin{array}{l} \alpha + \frac{1}{r} = z \\ \beta + \frac{1}{r} = y \end{array} \right. \quad / \quad rx^r + ax - y = 0 \quad \left\{ \begin{array}{l} \alpha \\ \beta \end{array} \right. \quad \left[\frac{ab}{r} \right]$$

$$z + y = \frac{a}{r} \quad / \quad x + \beta = \frac{-a}{rx} = \frac{-1}{r} \rightarrow (z + y) = (\alpha + \beta) + r(\frac{-1}{r}) \Rightarrow \frac{a}{r} = \frac{-1}{r} + 1 = \frac{1}{r} \Rightarrow a = 1$$

$$zy = \frac{b}{r} \quad / \quad \alpha\beta = -r \rightarrow zy = (\alpha + \frac{1}{r})(\beta + \frac{1}{r}) \Rightarrow zy = \alpha\beta + \frac{1}{r}(\alpha + \beta) + \frac{1}{r^2} = -r - \frac{1}{r} + \frac{1}{r^2}$$

$$zy = \frac{b}{r} = -r \Rightarrow \underline{b = -4} \quad \left\{ \left[\frac{ab}{r} \right] = \left[\frac{-4(1)}{r} \right] = \left[\frac{-r}{r} \right] = -1 \right. \quad \text{Red circle with a checkmark}$$

$$x^r + 4x + m = 0 \quad , \quad x^r + rx - rm = 0 \rightarrow a = \dots$$

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$$a^r + 4a + m = 0 \rightarrow m = -a^r - 4a \quad \left\{ \begin{array}{l} a^r + ra - rm = 0 \rightarrow a^r + ra - r(-a^r - 4a) = 0 \end{array} \right.$$

$$ra^r + ra = 0 \rightarrow ra(a + 5) = 0 \rightarrow a = \frac{0}{r} = 0$$

$$m = -a^r - 4a \quad a = 0 \rightarrow m = 0 \Rightarrow x^r + 4x + 0 = 0 \rightarrow (x+1)(x+4) = 0 \rightarrow x = -1, -4$$

$$\textcircled{4} \quad x^r + rx - 10 = 0 \rightarrow (x+5)(x-r) = 0 \rightarrow x = -5, r$$

$$-5 = \dots$$

$$|r - (-1)| = \frac{r}{r} \rightarrow \dots$$

