

$$\alpha = \beta \rightarrow \beta \times \beta = \frac{1}{4} \rightarrow \beta^2 = \frac{1}{4} \rightarrow \beta = \pm \frac{1}{2} \rightarrow \alpha = \pm \frac{1}{2}$$

$$\alpha \beta = \frac{1}{4}$$

$$\alpha + \beta = \frac{a}{4} \rightarrow \begin{cases} 2 + \frac{1}{2} = \frac{a}{4} \rightarrow \frac{5}{2} = \frac{a}{4} \rightarrow a = 10 \\ -2 - \frac{1}{2} = \frac{a}{4} \rightarrow a = -10 \end{cases} \quad 1 - (-1) = 14$$

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$$3x^2 - (m+1)x + 1 = 0 \quad \frac{1}{\sqrt{a}} + \frac{1}{\sqrt{b}} = \frac{1}{\sqrt{ab}} \rightarrow \frac{1}{a} + \frac{1}{b} + \frac{2}{\sqrt{ab}} = 2a$$

$$5a + b = \frac{m+1}{4} \quad P = \frac{1}{4} \rightarrow \frac{1}{a} + \frac{1}{b} = \frac{m+1}{4} \rightarrow \frac{1}{a} + \frac{1}{b} = m+1, \quad \sqrt{ab} = \sqrt{\frac{1}{4}} = \frac{1}{2}$$

$$\rightarrow \frac{2}{\sqrt{ab}} = 4 \quad m+1+1 = 2a \rightarrow m = -1 \quad m x^2 + 3x + 1 = 0 \rightarrow P = \frac{1}{m} = -1$$

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$$\alpha + \beta = 1 \quad \alpha \beta = -2 \rightarrow x^2 - x - 2 = 0 \rightarrow 5x^2 + kx^2 - 9x - 2 = (x^2 - x - 2)(Ax + B)$$

$$\rightarrow Ax^2 + (B-A)x^2 + (-B-2A)x - 2B = 5x^2 + kx^2 - 9x - 2$$

$$A = 5$$

$$-2B = -2 \rightarrow B = 1$$

$$B - A = k \rightarrow 1 - 5 = -4 = k$$

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$$3\alpha^2 + 2\beta^2 = 2\alpha^2 + 2\beta^2 + \alpha^2 = 12\sqrt{2} + 10 \quad \Delta = 34 - 4a \quad a = \frac{-4 - \sqrt{34 - 4a}}{2}$$

$$\rightarrow \alpha^2 = \frac{34 + 34 - 4a + 12\sqrt{34 - 4a}}{4} \rightarrow \frac{68 - 4a + 12\sqrt{34 - 4a}}{4} = 12\sqrt{2} \rightarrow \sqrt{34 - 4a} = 4\sqrt{2}$$

$$\rightarrow 34 - 4a = 32 \rightarrow a = 1$$

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$$x^2 = t \rightarrow t^2 - vt - a = 0$$

$$t = \frac{v + \sqrt{v^2 + 4a}}{2} \rightarrow x^2 = \frac{v + \sqrt{v^2 + 4a}}{2}$$

$$\rightarrow x_1 = \sqrt{\frac{v + \sqrt{v^2 + 4a}}{2}} \quad x_2 = \sqrt{\frac{v - \sqrt{v^2 + 4a}}{2}} \rightarrow P = -\sqrt{\frac{(v + \sqrt{v^2 + 4a})^2}{4}} \rightarrow P = -\frac{(v + \sqrt{v^2 + 4a})^2}{4}$$

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$$\frac{(v + \sqrt{v^2 + 4a})^2}{4} = \frac{v^2 + 4a + 2v\sqrt{v^2 + 4a}}{4} = \frac{v^2 + 4a}{4} + \frac{v\sqrt{v^2 + 4a}}{2}$$

$$r_1 x^r + a x - 4 = 0 \quad S = r_1 + r_2 = -\frac{a}{r_1 a} = -\frac{1}{r_1} \quad P = -\frac{4}{r_1 a} = -\frac{r_1}{a}$$

$$r_1 x^r - a x + b = 0 \quad S = r_1 + r_2 + 1 = -\frac{1}{r_1} + 1 = \frac{1}{r_1} = \frac{a}{r_1} \rightarrow \boxed{a=1} \quad P = r_1 r_2 + \frac{1}{r_1} (r_1 + r_2) + \frac{1}{r_1} =$$

$$-r_1 + \frac{1}{r_1} (1 - \frac{1}{r_1}) + \frac{1}{r_1} = -r_1 \rightarrow \frac{b}{r_1} = -r_1 \rightarrow b = -4. \quad \left[\frac{ab}{r_1} \right] = \left[-\frac{4}{r_1} \right] = -r_1$$

$$\alpha x^r + a x - b = 0 \rightarrow \alpha x^r = a x + b \rightarrow x^r = x + \frac{b}{a} \rightarrow \beta^r = \beta + \frac{b}{a} \quad , \quad \alpha^r = \alpha + \frac{b}{a}$$

$$\alpha + \beta = 1 \rightarrow \alpha = 1 - \beta \quad r_0 \beta^r + r_0 \alpha^r = r_0 \beta = 1 \rightarrow r_0 \beta + r_0 \frac{b}{a} + r_0 \alpha + r_0 \frac{b}{a} - r_0 \beta = 1 \rightarrow$$

$$r_0 (\alpha + \beta) + 4 \cdot \frac{b}{a} = 1 \rightarrow 4 \cdot \frac{b}{a} = -r_0 \rightarrow \frac{b}{a} = -\frac{1}{r_0}$$

$$|\alpha - \beta| = \frac{\sqrt{\Delta}}{|a|} = \frac{1}{|a|} \sqrt{a^r + r_0 a b} = \sqrt{1 + \frac{r_0 b}{a}} \sqrt{1 - \frac{r_0}{r_0}} = \sqrt{1 - \frac{1}{a}} = \frac{r_0}{\sqrt{a}}$$

$$x^r (a+1)x + a = 0 \quad \left. \begin{array}{l} \text{لأن } r_1 = r_2 = r_0 \\ r_1 + 1 \end{array} \right\} \quad S = a + 1 = r_0 n \rightarrow a = r_0 n - 1$$

$$\rightarrow a = r_0 (1) - 1 = r_0 \rightarrow P = r_0$$

$$x^r - (r_0 a + 1)x + b = 0 \xrightarrow{a=r_0} x^r - (r_0^2 + 1)x + b = 0 \rightarrow \left. \begin{array}{l} \text{لأن } r_1 = r_2 = r_0 \\ r_1 + r_2 \end{array} \right\} \quad S = 10 = r_0 k + r_0 \rightarrow k = r_0$$

$$P = r_0 \times 4 = 4r_0$$

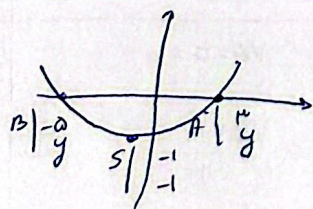
$$r_0 - r_0 = P_1 - P_1 = r_0$$

$$x^r + x - (1 + m^r) = 0 \rightarrow \alpha + \beta = -1 = S \quad P = \alpha \beta = -(1 + m^r)$$

$$\alpha^r + \beta^r = S^r - r_0 P = 1 + r_0 + r_0 m^r = r_0 + r_0 m^r$$

$$m^r > 0 \rightarrow \text{لأن } m^r > 0 \rightarrow m = 0$$

$$m = 0 \rightarrow r_0 m^r = r_0 \quad \boxed{r_0 m^r = r_0}$$



$$\alpha + \beta = -r_0 \rightarrow \alpha_5 = -\frac{r_0}{r_0} = -1$$

$$\alpha^r + \beta^r = a \rightarrow (\alpha + \beta)^r - r_0 \alpha \beta = a \rightarrow \alpha \beta = -\frac{1}{r_0}$$

$$y = a(x^r + r_0 x - \frac{1}{r_0}) \rightarrow 1 = a(1 - r_0 - \frac{1}{r_0}) \rightarrow a = -\frac{r_0}{r_0}$$

$$\rightarrow y = -\frac{r_0}{r_0} (x^r + r_0 x - \frac{1}{r_0}) \xrightarrow{x=0} y = -\frac{r_0}{r_0} x - \frac{1}{r_0} = \frac{1}{r_0}$$