



$$\tan \hat{B} = \frac{5}{12} \rightarrow \frac{b}{c} = \frac{5}{12}$$

$$\rightarrow \begin{cases} b = 5x \\ c = 12x \end{cases} \quad a^2 = b^2 + c^2$$

$$\rightarrow a^2 = (5x)^2 + (12x)^2 = 169x^2 \rightarrow a = 13x$$

$$\sin \hat{C} = \frac{c}{a} = \frac{12x}{13x} \rightarrow \sin \hat{C} = \frac{12}{13}$$

$$\cos \hat{C} = \frac{b}{a} = \frac{5x}{13x} \rightarrow \cos \hat{C} = \frac{5}{13}$$

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حل:

$$B = \frac{\sin^2 135^\circ - \cos^2 120^\circ}{\tan^2 150^\circ} = \frac{\left(-\frac{\sqrt{2}}{2}\right)^2 - \left(-\frac{1}{2}\right)^2}{\left(-\frac{\sqrt{3}}{2}\right)^2} = \frac{\frac{1}{2} - \frac{1}{4}}{\frac{3}{4}} = \frac{\frac{1}{4}}{\frac{3}{4}} = \frac{1}{3}$$

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حل:

$$\left(\frac{1}{\cos x} + 1\right)\left(\frac{1}{\cos x} - 1\right) = \frac{1 + \cos x}{\cos x} \times \frac{1 - \cos x}{\cos x} = \frac{1 - \cos^2 x}{\cos^2 x} = \frac{\sin^2 x}{\cos^2 x} = \tan^2 x$$

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حل:

$$\tan \theta = 4 \rightarrow \boxed{\sin \theta = 4 \cos \theta}$$

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حل:

$$A = \frac{2 \sin \theta + 4 \cos \theta}{\cos \theta - \sin \theta} = \frac{4 \cos \theta + 4 \cos \theta}{\cos \theta - 4 \cos \theta} = \frac{8 \cos \theta}{-3 \cos \theta} = -\frac{8}{3}$$



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$$\sqrt{2}x + \sqrt{6}y = -1 \rightarrow m = -\frac{\sqrt{2}}{\sqrt{6}} = -\frac{\sqrt{3}}{3}$$

حل:

$$\tan \theta = -\frac{\sqrt{3}}{3} \rightarrow \theta = \boxed{150^\circ}$$

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$$m = \tan^{-1} 150^\circ \rightarrow m = -\frac{\sqrt{3}}{3}$$

حل:

$$A = \begin{pmatrix} 2\sqrt{3} \\ 0 \end{pmatrix} \quad y - y_A = m(x - x_A)$$

$$\rightarrow y - 0 = -\frac{\sqrt{3}}{3}(x - 2\sqrt{3}) \rightarrow \boxed{y = -\frac{\sqrt{3}}{3}x + 2}$$

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$$A = 0.25^{-1/6} \times \left(\frac{1}{4}\right)^{-1/6} = \left(\frac{1}{4}\right)^{-1/6} \times \left(\frac{1}{4}\right)^{-1/6} = \left(\frac{1}{4}\right)^{-1/3}$$

حل:

$$A = \sqrt[3]{\frac{1}{4}} = \frac{1}{\sqrt[3]{4}} = \frac{1}{\sqrt{2}} = \boxed{\frac{\sqrt{2}}{2}}$$

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$$A = \sqrt{\frac{a}{6}} \sqrt{\frac{81}{256a^2}} = \sqrt{\frac{a}{6} \times \frac{3}{4|a|}} = -\sqrt{\frac{ra}{24a}} = -\sqrt{\frac{1}{8}} = \boxed{-\frac{1}{2}}$$

حل:

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$$\sqrt[5]{x}\sqrt{x} = \sqrt[5]{27} \rightarrow \sqrt{x^3} = \sqrt[5]{3}$$

$$\xrightarrow{\text{توان } 10} x^3 = (\sqrt[5]{3})^{10} \rightarrow x^3 = 3^2 \rightarrow x = \sqrt[3]{3^2} = \sqrt[3]{9}$$

حل:

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$$\frac{1}{\sqrt{3}-1} \times \frac{\sqrt{3}+1}{\sqrt{3}+1} = \frac{\sqrt{3}+1}{\sqrt{3}-1} \times \frac{\sqrt{9}+\sqrt{3}+1}{\sqrt{9}+\sqrt{3}+1} = \frac{(\sqrt{3}+1)(\sqrt{9}+\sqrt{3}+1)}{3-1}$$

حل:

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$$\begin{cases} x^2 + y^2 = (x + y)(x^2 + y^2 - xy) = 1 \times (5 + 2) = \boxed{7} \end{cases}$$

حل:

$$\begin{cases} x^2 + y^2 = (x + y)^2 - 2xy \rightarrow 5 = 1 - 2xy \rightarrow \boxed{xy = -2} \end{cases}$$

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$$\frac{\sqrt{4}}{\sqrt{4} + \sqrt{6} + \sqrt{9}} \times \frac{\sqrt{2} - \sqrt{3}}{\sqrt{2} - \sqrt{3}} = \frac{\sqrt{4}(\sqrt{2} - \sqrt{3})}{(\sqrt{2})^2 - (\sqrt{3})^2} = \frac{2 - \sqrt{12}}{-1} = \boxed{\sqrt{12} - 2}$$

حل:

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$$\sin \theta + \frac{1}{\sin \theta} = -2 \rightarrow \sin \theta = \boxed{-1}$$

حل:

$$A = \sin^{\circ} \theta + \cos^{\circ} \theta = (-1)^{\circ} + 0 = \boxed{-1}$$

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$$\text{اگر } 30^{\circ} < \theta < 150^{\circ} \rightarrow \frac{1}{2} < \sin \theta \leq 1$$

$$\rightarrow \frac{1}{2} < \frac{2m-1}{2} \leq 1 \rightarrow 1 < 2m-1 \leq 2 \rightarrow 2 < 2m \leq 3$$

$$\rightarrow \boxed{1 < m \leq \frac{3}{2}}$$

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