

$$I = 6^\circ$$

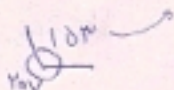
$$90 + 3 \times 9 + 2 \times 12 = 150^\circ$$

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$$6 \times 9 = 54^\circ \quad 12 \times 9 = 108^\circ$$

$$\begin{array}{r|l} 90^\circ & 120^\circ \\ \hline \Delta \theta & 120^\circ \end{array}$$

$$\alpha = |\delta_1 \delta M - \gamma_0 H| = |(\delta_1 \delta \times \delta F) - (\gamma_0 \times 12)| = 10^\circ$$



$$7 \times 9 = 63^\circ$$

$$10 \times 9 = 90^\circ$$

$$\begin{array}{r|l} 90^\circ & 120^\circ \\ \hline 11^\circ & 9^\circ \end{array}$$

$$12 + 60 + 9 = 181^\circ$$

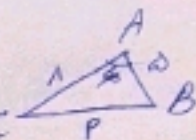
$$\alpha = |(\delta_1 \delta \times 11) - (9 \times 120)| = 180 - 99 = 81^\circ$$

$$A \quad B \quad \frac{\pi}{r} R^2 S = \frac{\pi \times 9}{r} = \frac{9\pi}{r} \times \frac{1}{r} = \frac{9\pi}{r^2}$$

$$L = aR + rR = \frac{\pi}{r} \times 9 + 9 = \left(\frac{\pi}{r} + 9 \right)$$

$$\sin 60^\circ = \frac{\sqrt{3}}{2}$$

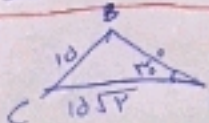
$$\cos 60^\circ = \frac{1}{2}$$



$$S = \frac{1}{2} ab \sin C = \frac{1}{2} \times a \times b \times \frac{\sqrt{3}}{2} = 10\sqrt{3}$$

$$P = \sqrt{a^2 + b^2 - 2ab \cos \alpha} = \sqrt{1^2 + 2^2 - 2(1)(2)\left(\frac{1}{2}\right)} = \sqrt{3} = \sqrt{3}$$

$$L = a + b + c = 10$$



$$\sin 105^\circ = \frac{1}{2}$$

$$\frac{a}{\sin A} = \frac{b}{\sin B} \Rightarrow \frac{1}{\sin 105^\circ} = \frac{b}{\sin 15^\circ} \Rightarrow b = \frac{\sin 15^\circ}{\sin 105^\circ} = \frac{\sqrt{3}}{2}$$

$$C = \frac{108\pi}{180} = \frac{3\pi}{5}$$

$$B = \frac{\pi}{2}$$

$$180^\circ - 105^\circ - 15^\circ = 60^\circ$$

$$C = 180 - 105 - 15 = 60^\circ$$

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$$\frac{\tan 2\alpha}{\tan -\alpha} = \textcircled{-1}$$

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$$\tan -\alpha = (\alpha - \pi) \tan \alpha \dots \dots$$

$$\tan 1\delta = \frac{\pi}{14} = \alpha \quad \frac{1}{\alpha} = \cot 1\delta = \tan 1\delta$$

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$$-\frac{1}{\alpha} = -\cot 1\delta = \tan 1\delta \quad -\alpha = \tan 1\delta \quad \frac{1}{\alpha} = \tan 2\delta$$

$$A = \frac{\frac{1}{\alpha} + (-\frac{1}{\alpha})}{-\frac{1}{\alpha} - \frac{1}{\alpha}} = \textcircled{\frac{1}{1+1}}$$

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$$\cos \frac{\alpha}{2} = \sqrt{\frac{1 + \cos \alpha}{2}} =$$

$$= \sqrt{\frac{\frac{\sqrt{5}+1}{2} + 1}{2}} = \textcircled{\frac{\sqrt{5}+1}{2}}$$

$$2\delta = 2\delta$$

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$$\cos 2\delta = \sin 9\delta$$

$$= \textcircled{\frac{\sqrt{5}+1}{2}}$$

$$90 - 2\delta = 9\delta$$

(ب)