

$$3 \times 30 = 90$$

$$90 \div 2 = 45$$

$$90 + 27 = 117 - 30 = 87 \Rightarrow 34 - 2 \cdot 7 = 20$$

(الف)

(ب)

$$| \omega, \omega_m - 30^\circ | \Rightarrow | \omega, \omega_v \omega_f - 90^\circ | = | 27^\circ - 90^\circ | = 63^\circ$$



$$18 \times 6 = 108$$

$$18 \div 2 = 9$$

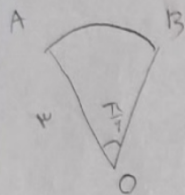
$$9 \times 90$$

$$\Rightarrow 108 - 108 = 0$$

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$$| \omega, \omega (18) - 30^\circ | = | 99 - 108 | = 9$$



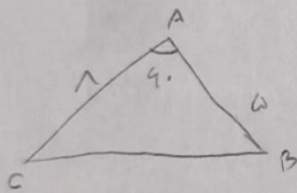
$$\frac{\alpha}{r} R^2 \Rightarrow \frac{\pi}{r} \times \frac{r^2}{r} = \frac{\pi}{r} = \frac{r}{r}$$

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$$\frac{\pi}{r} (r) + \frac{r}{r} = 1 + \frac{\pi}{r}$$

(ب)



$$S = \frac{1}{2} \times a \times b \times \frac{1}{r} = \frac{1}{2} \times \sqrt{3}$$

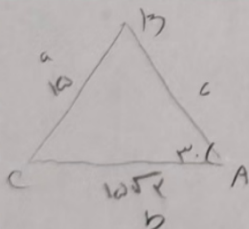
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$$CB = \sqrt{a^2 + b^2 - 2ab \cos C} = \sqrt{3}$$

(ب)

$$P_a = a + b + c = 2\sqrt{3}$$



$$\hat{B} + \hat{C} = 180^\circ \Rightarrow A = 180^\circ - 180^\circ = 0^\circ$$

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} \Rightarrow \frac{10}{\sin 30^\circ} = \frac{10\sqrt{2}}{\sin B} \Rightarrow \sin B = \frac{10\sqrt{2}}{20} = \frac{\sqrt{2}}{2}$$

$$\Rightarrow \sin B = \sin 45^\circ$$

$$C = 180^\circ - B \Rightarrow 180^\circ - 45^\circ = 135^\circ \Rightarrow \sin C = \sin 45^\circ$$

$$\hat{B} = 45^\circ \Rightarrow \frac{\pi}{4} \quad \hat{C} = 135^\circ = \frac{3\pi}{4}$$

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$$\frac{\tan(\pi - \alpha) + r \tan(\pi + \alpha)}{\tan(r\pi - \alpha) - \tan(r\pi + \alpha)} = \frac{-\tan \alpha + r \tan \alpha}{-\tan \alpha - \tan \alpha} = \frac{r \tan \alpha}{-2 \tan \alpha} = -\frac{r}{2}$$

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$$\tan \frac{\pi}{11} = a \rightarrow a = \tan 18^\circ$$

$$\frac{r \tan 18^\circ + \tan 18^\circ}{r \tan 18^\circ - \tan 18^\circ} = \frac{r \tan(\frac{\pi}{11} + 18^\circ) + \tan(\frac{\pi}{11} + 18^\circ)}{r \tan(\frac{\pi}{11} - 18^\circ) + \tan(\frac{\pi}{11} - 18^\circ)} = \frac{r \cot 18^\circ - \cot 18^\circ}{-r \tan 18^\circ - \tan 18^\circ} = \frac{r \cot 18^\circ - \cot 18^\circ}{-r \tan 18^\circ - \tan 18^\circ}$$

$$= -\frac{1}{r} \cot 18^\circ$$

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

$$= \frac{1 + \sin 2x + 1 - \sin 2x}{\sin^2 x - \cos^2 x} = \frac{2}{\sin^2 x - \cos^2 x} = 1 \rightarrow \frac{2}{\sin^2 x - \cos^2 x} = 1 \rightarrow \cos^2 x = -\frac{1}{2}$$

$$\tan^2 x = \frac{1 - \cos^2 x}{1 + \cos^2 x} = \frac{1 + \frac{1}{2}}{1 - \frac{1}{2}} = \frac{\frac{3}{2}}{\frac{1}{2}} = 3$$

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$$\frac{\sin^2 x - r \cos^2 x + 1}{\sin^2 x + r \cos^2 x - 1} = r \rightarrow \frac{\sin^2 x - r(1 - \sin^2 x) + 1}{\sin^2 x + r(1 - \sin^2 x) - 1} = \frac{r \sin^2 x - 1}{1 - \sin^2 x} = r \rightarrow r \sin^2 x - 1 = r \cos^2 x$$

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

$$\tan^2 x = \frac{\sin^2 x}{\cos^2 x} = \frac{\frac{r+1}{2r}}{\frac{r-1}{2r}} = \frac{r+1}{r-1}$$

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$$\cos(44^\circ) = \cos(2 \cdot 22^\circ) = 1 - 2 \sin^2 22^\circ = 1 - 2 \left(\frac{\sqrt{5}-1}{4} \right)^2 = \frac{\sqrt{5}+1}{4}$$

$$\sin(44^\circ) = \sin(2 \cdot 22^\circ) = 2 \sin 22^\circ \cos 22^\circ = 2 \left(\frac{\sqrt{5}-1}{4} \right) \left(\frac{\sqrt{5}+1}{4} \right) = \frac{\sqrt{5}-1}{4}$$

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