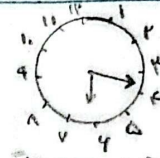


(الف) $4 \times 30 + 1 \times 4 + 27 = 153^\circ$

(ب) $|\Delta, \Delta_{\min} - 30h| = |\Delta, \Delta \times 54 - 30 \times 3| = 207^\circ$



(الف) $2 \times 30 + 2 \times 4 + 9 = 11^\circ$

(ب) $|\Delta, \Delta_{\min} - 30h| = |\Delta, \Delta \times 18 - 30 \times 4| = 11^\circ$

(الف) $S = \frac{\alpha}{r} R^2 = \frac{\pi}{12} \times 9 = \frac{3\pi}{4}$

(ب) $P = \alpha R + 2R = \frac{\pi}{4} \times 3 + 4 = \frac{\pi}{4} + 4$

(الف) $S = \frac{1}{r} \overline{AB} \times \overline{AC} \times \sin A = \frac{1}{r} \times \Delta \times \Delta \times \frac{\sin 45^\circ}{\frac{\sqrt{3}}{2}} = 10\sqrt{3}$

(ب) $\overline{BC} = \sqrt{\overline{AB}^2 + \overline{AC}^2 - 2\overline{AB} \times \overline{AC} \cos A} = \sqrt{2\Delta + 4\Delta - 4\Delta} = \Delta = V$ $P = \Delta + V + \Delta = 2\Delta$

$B + C = 180^\circ \Rightarrow A = 30^\circ$

$\frac{\Delta}{\sin 30^\circ} = \frac{\Delta\sqrt{2}}{\sin B} \Rightarrow \sin B = \frac{\sqrt{2}}{2} \Rightarrow B = 45^\circ \Rightarrow C = 105^\circ \Rightarrow B = \frac{\pi}{4}, C = \frac{7\pi}{12}$

$\frac{\tan(\pi - \alpha) + 3\tan(\pi + \alpha)}{\tan(2\pi - \alpha) - \tan(2\pi + \alpha)} = \frac{-\tan \alpha + 3\tan \alpha}{-\tan \alpha - \tan \alpha} = \frac{2\tan \alpha}{-2\tan \alpha} = (-1)$

$\tan \frac{\pi}{12} = \tan_{15^\circ} = a$

$\frac{3\tan_{15^\circ} + \tan_{15^\circ}}{3\tan_{15^\circ} - \tan_{15^\circ}} = \frac{3\tan(\frac{\pi}{12} - 15^\circ) + \tan(\frac{\pi}{12} + 15^\circ)}{3\tan(\pi - 15^\circ) - \tan(\frac{3\pi}{4} - 15^\circ)} = \frac{3\cot_{15^\circ} - \cot_{15^\circ}}{3\tan_{15^\circ} - \cot_{15^\circ}} = \frac{\cot_{15^\circ}}{3\tan_{15^\circ} - \cot_{15^\circ}} =$

$\frac{\frac{1}{a}}{-3a - \frac{1}{a}} = \frac{\frac{1}{a}}{\frac{-3a^2 - 1}{a}} = \frac{1}{-3a^2 - 1} = (-\frac{1}{3a^2 + 1})$

$$\frac{\sin \alpha + \cos \alpha}{\sin \alpha - \cos \alpha} + \frac{\sin \alpha - \cos \alpha}{\sin \alpha + \cos \alpha} = P$$

$$\frac{(\sin \alpha + \cos \alpha)^2 + (\sin \alpha - \cos \alpha)^2}{(\sin \alpha - \cos \alpha)(\sin \alpha + \cos \alpha)} = \frac{P \sin^2 \alpha + P \cos^2 \alpha}{\sin^2 \alpha - \cos^2 \alpha} = \frac{P}{P \sin^2 \alpha - 1} = P$$

$$P \sin^2 \alpha - 1 = \frac{P}{P} \Rightarrow \sin^2 \alpha = \frac{2}{P} \Rightarrow \cos^2 \alpha = \frac{1}{P} \Rightarrow \tan^2 \alpha = \frac{2}{1} = 2$$

$$\frac{\sin^2 \alpha - P \cos^2 \alpha + 1}{\sin^2 \alpha + P \cos^2 \alpha - 1} = P \Rightarrow \frac{\sin^2 \alpha - \cos^2 \alpha + (1 - \cos^2 \alpha)}{\sin^2 \alpha + \cos^2 \alpha + (\cos^2 \alpha - 1)} = \frac{P \sin^2 \alpha - \cos^2 \alpha}{\cos^2 \alpha} = P \tan^2 \alpha - 1 = P$$

$$\tan^2 \alpha = \frac{2}{P}$$

$$\text{الف) } \cos_{(P, \Delta)} = \frac{\sqrt{P+P}}{P}$$

$$\cos_{\Delta} = \cos_{P, \Delta}^2 - \sin_{P, \Delta}^2 = \cos_{P, \Delta}^2 - 1 + \cos_{P, \Delta}^2 = P \cos_{P, \Delta}^2 - 1 = \frac{\sqrt{P}}{P}$$

$$\cos_{P, \Delta}^2 = \frac{\sqrt{P+P}}{P} \Rightarrow \cos_{P, \Delta} = \frac{\sqrt{P+P}}{P}$$

$$\text{ب) } \sin_{(P, \Delta)} = \sin\left(\frac{\pi}{P} - P, \Delta\right) = \cos_{P, \Delta} = \frac{\sqrt{P+P}}{P}$$

$$\cos_{\Delta} = \cos_{P, \Delta}^2 - \sin_{P, \Delta}^2 = \cos_{P, \Delta}^2 - 1 + \cos_{P, \Delta}^2 = P \cos_{P, \Delta}^2 - 1 = \frac{\sqrt{P}}{P}$$

$$\hookrightarrow \cos_{P, \Delta}^2 = \frac{\sqrt{P+P}}{P}$$

$$\hookrightarrow \cos_{P, \Delta} = \frac{\sqrt{P+P}}{P}$$