

الف) $\alpha = \frac{\omega r}{r} + (r \times \omega) + \phi = 27 + 120 + \phi = 153^\circ$



ب) $|\omega_1 \omega M - \omega_2 H| = |\omega_1 \omega \times 12 - \omega_2 \times 3| = |27 - 90| = 207 \Rightarrow$
 $\alpha = 360 - 207 = 153^\circ$

الف) $\alpha = \frac{1\Lambda}{r} + (r \times \omega) + (r \times \phi) = 9 + 90 + 12 = 111^\circ$



ب) $|\omega_1 \omega M - \omega_2 H| = |\omega_1 \omega \times 12 - \omega_2 \times 6| = |99 - 180| = 111^\circ$

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

ب) $p = \alpha R + r R = (\frac{\pi}{4} \times 3) + (r \times 3) = \frac{\pi}{4} + 6$

الف) $S_{\Delta ABC} = \frac{1}{2} \times \omega \times \Lambda \times \sin 45^\circ = 10\sqrt{2}$

ب) $BC = \sqrt{\frac{\omega^2}{20} + \frac{\Lambda^2}{40} - \frac{2 \times \omega \times \Lambda \times \cos 45^\circ}{\Lambda \times \frac{1}{r} \times 40}} = \sqrt{49} = 7 \Rightarrow P_{\Delta ABC} = \omega + \Lambda + 7 = 20$

$\hat{B} + \hat{C} = 120^\circ \Rightarrow \hat{A} = 60^\circ$ طبق قانون سینوسها $\frac{10}{\sin 60^\circ} = \frac{10\sqrt{3}}{\sin B} \Rightarrow$

$\sin B = \frac{\sqrt{3}}{2} \Rightarrow \hat{B} = 60^\circ \Rightarrow \hat{B} = 60^\circ \times \frac{\pi}{180} = \frac{\pi}{3}$

$\hat{C} = 180^\circ - \hat{B} = 180^\circ - 60^\circ = 120^\circ \Rightarrow \hat{C} = 120^\circ \times \frac{\pi}{180} = \frac{2\pi}{3}$

$$\frac{-\tan \alpha + r \tan \alpha}{-\tan \alpha - \tan \alpha} = \frac{r \tan \alpha}{-r \tan \alpha} = -1$$

$$\frac{\pi}{1r} \times \frac{1a}{\pi} = 1a^\circ \Rightarrow \tan 1a^\circ = a \Rightarrow \cot 1a^\circ = \frac{1}{a}$$

$$A = \frac{r \tan(90 - 1a) + \tan(90 + 1a)}{r \tan(1a - 1a) - \tan(1r0 - 1a)} = \frac{r \cot 1a^\circ - \cot 1a^\circ}{r(-\tan 1a^\circ) - \cot(1a^\circ)}$$

$$= \frac{\frac{1}{a}}{-ra - \frac{1}{a}} = \frac{\frac{1}{a}}{-ra^2 - 1} = -\frac{1}{ra^2 + 1}$$

$$\frac{r \sin^2 \alpha + \cos^2 \alpha + r \sin \alpha \cos \alpha + \sin^2 \alpha + \cos^2 \alpha - r \sin \alpha \cos \alpha}{\sin^2 \alpha - \cos^2 \alpha} = r$$

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

$$\frac{1 - \cos^2 \alpha}{r} = r \times \frac{1 + \cos^2 \alpha}{r} + 1$$

$$\frac{1 - \cos^2 \alpha}{r} + r \times \frac{1 + \cos^2 \alpha}{r} = 1$$

$$\frac{1 - r \cos^2 \alpha}{1 + \cos^2 \alpha} = r \Rightarrow r + r \cos^2 \alpha = 1 - r \cos^2 \alpha \Rightarrow r \cos^2 \alpha = -r$$

$$\Rightarrow \cos^2 \alpha = -\frac{r}{r} \Rightarrow \tan^2 \alpha = \frac{1 + \frac{r}{r}}{1 - \frac{r}{r}} = \frac{1 + 1}{1 - 1} = \frac{2}{0} = \infty$$

$$\cos^2 44.7^\circ = \frac{1 + \cos 89.4^\circ}{r} = \frac{1 + \frac{\sqrt{r}}{r}}{r} = \frac{r + \sqrt{r}}{r} \Rightarrow$$

$$\cos 44.7^\circ = \frac{\sqrt{r + \sqrt{r}}}{r}$$

$$\sin^2 44.7^\circ = \frac{1 - \cos 89.4^\circ}{r} = \frac{1 - \frac{\sqrt{r}}{r}}{r} = \frac{r - \sqrt{r}}{r} \Rightarrow$$

$$\sin 44.7^\circ = \frac{\sqrt{r - \sqrt{r}}}{r}$$