



$$r \times \omega = 12$$

$$\frac{1}{r} \times \omega = 12$$

$$12 + 12 + 12 = 36$$

(الف)

$$|\omega, \omega_{min} - \omega_0 h| \Rightarrow \frac{1}{r} \times \omega - r_0 \times \omega = 12 - 9 = 3$$

(ب)



$$r \times \omega = 9$$

$$r \times \omega = 12$$

$$12 + 9 + 9 = 30$$

(الف)

$$|\omega, \omega_{min} - \omega_0 h| \Rightarrow \left| \frac{1}{r} \times 12 - r_0 \times 9 \right| = |12 - 18| = 6$$

(ب)

$$\frac{\pi}{r} = r_0$$

$$\frac{r_0}{r_0} = \frac{1}{12}$$

$$S = \pi R^2 \rightarrow 9\pi \text{ cm}^2$$

(الف)

$$\frac{1}{r} \times \pi = \frac{\pi}{r} \rightarrow S$$

$$P = \pi r R \rightarrow 9\pi \quad \pi \times \frac{1}{r} = \frac{\pi}{r}$$

(ب)

$$\frac{\pi}{r} + 9$$

$$\omega \times \frac{1}{r} = 10 \rightarrow S$$

(الف)

$$B = \sqrt{r^2 + 9\pi - \frac{1}{r} \times \pi} = \sqrt{18 - \pi} = \sqrt{18} = 4.24$$

$$P = v + \omega + \lambda = 10$$

$$\frac{1}{\sin A} = \frac{1}{\sin B} = \frac{AB}{\sin C}$$

(الف)

$$\frac{1}{r} = r_0 = \frac{1}{\sqrt{r}} \rightarrow B = \pi \quad C = 180 - A = 180$$

$$\frac{\pi}{r} = \frac{\pi}{r} = \frac{\pi}{r}$$

$$\frac{-\tan \alpha + r \tan \alpha}{-\tan \alpha - \tan \alpha} = -\frac{r \tan \alpha}{r \tan \alpha} = \boxed{-1} \quad (8)$$

$$\begin{aligned} r \tan\left(\frac{\pi}{r} - \frac{\pi}{1r}\right) + \tan\left(\frac{\pi}{r} + \frac{\pi}{1r}\right) &= \frac{r \frac{1}{a} - \frac{1}{a}}{-ra - \frac{1}{a}} = \frac{\frac{1}{a}}{-\frac{ra^2+1}{a}} = \frac{1}{ra^2+1} \\ r \tan\left(\pi - \frac{\pi}{1r}\right) + \tan\left(\frac{r\pi}{r} + \frac{\pi}{1r}\right) &= -ra - \frac{1}{a} \\ A &= \frac{1}{ra^2+1} \end{aligned} \quad (v)$$

$$\frac{\sin^r u + \cos^r u + r \sin u \cos u + \sin^r u + \cos^r u - r \sin u \cos u}{\sin^r u - \cos^r u} = \frac{1}{\sin^r u - \cos^r u} \quad (1)$$

$$\sin^r u - \cos^r u = \frac{1}{r} \Rightarrow 1 - r \cos^r u = \frac{1}{r} \Rightarrow r \cos^r u = \frac{r}{r} \quad \cos^r u = \frac{1}{r}$$

$$\sin^r u = \frac{r}{r} \quad \tan^r u = \frac{\frac{r}{r}}{\frac{1}{r}} = \boxed{r}$$

$$r \sin^r u - r \cos^r u + 1 = \sin^r u + \cos^r u - 1 \quad (9)$$

$$\begin{aligned} r \sin^r u + r &= r \cos^r u \\ r \sin^r u + r &= r - r \sin^r u \Rightarrow r \sin^r u = r \\ \sin^r u &= \frac{r}{r} \quad \cos^r u = \frac{0}{r} \quad \tan^r u = \frac{\frac{r}{r}}{\frac{0}{r}} = \boxed{\frac{r}{0}} \end{aligned}$$

$$\cos(r, \omega) = \sqrt{\frac{1 + \cos 80}{r}} = \frac{1 + \frac{\sqrt{r}}{r}}{r} = \frac{\sqrt{r} + \sqrt{r}}{r} \quad (1)$$

$$\sin(r, \omega) = \sqrt{\frac{1 - \cos 80}{r}} = \sqrt{\frac{1 - \frac{\sqrt{r}}{r}}{r}} = \frac{\sqrt{r} - \sqrt{r}}{r}$$