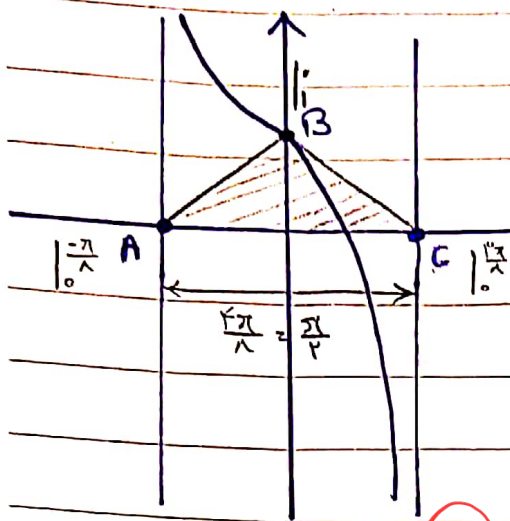




$$y = \tan(-2x + \frac{\pi}{2})$$

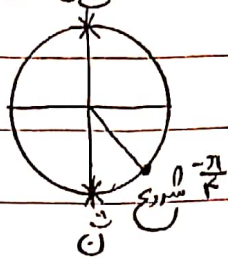
$$y = -\tan(2x - \frac{\pi}{2})$$

$$B = f(0) = -\tan(-\frac{\pi}{2}) = +1$$

$$-2x + \frac{\pi}{2} = \frac{\pi}{2}$$

$$\frac{\pi}{2} - \frac{2x}{2} = 2x$$

$$-\frac{\pi}{2} = 2x \Rightarrow x = -\frac{\pi}{4}$$



$$-2x + \frac{\pi}{2} = -\frac{\pi}{2} \Rightarrow 2x = \frac{\pi}{2} \rightarrow x = \frac{\pi}{4}$$

$$S_{ABC} = \frac{\frac{\pi}{2} \times 1}{2} = \frac{\pi}{4}$$

$$2r - (\sin d)q - \frac{1}{r} \cos^2 d = 0$$

$$\frac{r}{q} - \frac{1}{r} \sin d - \frac{1}{r} + \frac{1}{r} \sin^2 d = 0$$

$$1 + \tan^2 d = ?!$$

$$\frac{1}{r} \sin^2 d - \frac{1}{r} \sin d + \frac{1}{r^4} = 0 \rightarrow q \sin^2 d - r \sin d + 1 = 0$$

$$\Delta = 1r^2 - 4r = 1 \Rightarrow \sin d = \frac{1r \pm 1}{q}$$

$$\sin d = \frac{1}{r}$$

$$1 + \tan^2 d = \frac{1}{\cos^2 d}$$

$$\frac{r}{q} = \frac{1}{r} = \frac{1}{r} \times r = 1$$

$$\frac{r}{q} = \frac{1}{r} \checkmark$$

$$\Rightarrow \cos d = \frac{\sqrt{1}}{r} \Rightarrow \cos^2 d = \frac{1}{r^2} \Rightarrow \frac{1}{\cos^2 d} = \frac{r^2}{1}$$

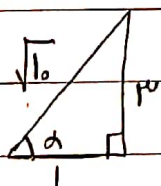
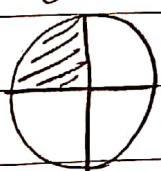
$$\lg(\sin d) - \lg(-\cos d) = \lg r$$

$$\Rightarrow \frac{\sin d}{-\cos d} = ?!$$

$$\frac{\sin d}{\cos d} = \lg r \Rightarrow \frac{\sin d}{\cos d} = -r$$

$$-r \cos d = ?$$

$$\tan d = -r$$



$$-r \cos d = -r(-\frac{1}{\sqrt{1+r^2}}) = \frac{r}{\sqrt{1+r^2}} = \frac{r\sqrt{1+r^2}}{1+r^2}$$

$$1 - \sin^2 \theta$$

$$\sin^2 \theta + \cos^2 \theta = \frac{r}{a} \Rightarrow \cos^2 \theta + \sin^2 \theta = ?!$$

$$(\sin^2 \theta + \cos^2 \theta)^2 = 1$$

$$\sin^2 \theta + \cos^2 \theta + 2 \sin^2 \theta \cos^2 \theta = 1$$

$$\sin^2 \theta (\sin^2 \theta - 1) = \frac{1}{a}$$

$$\sin^2 \theta \cos^2 \theta = \frac{1}{a}$$

$$\begin{cases} \sin^2 \theta + \cos^2 \theta = \frac{r}{a} \\ * \sin^2 \theta - \sin^2 \theta = -\frac{1}{a} \end{cases}$$

$$\cos^2 \theta + \sin^2 \theta = \frac{r}{a}$$

$$r \sin \alpha + \sin \alpha \cos \alpha$$

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

$$0 \leq \cos^2 \alpha \leq 1 \Rightarrow r \sin \alpha + \sin \alpha \cos \alpha < 0$$

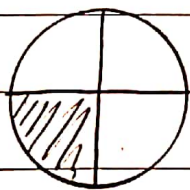
$$0 \leq r \cos^2 \alpha \leq r \Rightarrow \sin \alpha (r + \cos \alpha) < 0 \Rightarrow \sin \alpha < 0$$

$$-r \leq -r \cos^2 \alpha \leq 0 \Rightarrow -1 \leq \cos \alpha \leq 1$$

$$0 \leq r - r \cos^2 \alpha \leq r \Rightarrow r \leq r + \cos \alpha \leq r$$

$$\tan \alpha \left(\sin \alpha - \frac{1}{\sin \alpha} \right) > 0 \Rightarrow \tan \alpha \left(\frac{\sin^2 \alpha - 1}{\sin \alpha} \right) > 0$$

$$\frac{\sin \alpha}{\cos \alpha} \left(\frac{\sin^2 \alpha - 1}{\sin \alpha} \right) > 0 \Rightarrow -\frac{\cos^2 \alpha}{\cos \alpha} > 0 \Rightarrow \cos \alpha < 0$$



$\Rightarrow$ Circle is in the third quadrant *

$$\frac{r}{\sin \alpha} + \frac{r}{\cos \alpha} = 0 \Rightarrow \tan \alpha + \cot \alpha = ?!$$

$$\frac{r \cos \alpha + r \sin \alpha}{\sin \alpha \cos \alpha} = 0 \Rightarrow r \cos \alpha + r \sin \alpha = 0 \Rightarrow r \cos \alpha = -r \sin \alpha$$

$$\tan \alpha = \frac{\sin \alpha}{\cos \alpha} = \frac{-r}{r}$$

$$\cot \alpha = \frac{\cos \alpha}{\sin \alpha} = \frac{-r}{r}$$

$$\Rightarrow \frac{-r}{r} - \frac{r}{r} = \frac{-r - r}{r} = \frac{-2r}{r}$$

* $\cos 30^\circ$

$$\sqrt{1 + \sin 20^\circ \cos 30^\circ} \rightarrow \sqrt{1 + \cos 30^\circ} = \sqrt{2 \cos 15^\circ} = \sqrt{2} \cos 15^\circ \quad -V$$

$$\sin A + \sin B = 2 \sin \left(\frac{A+B}{2} \right) \cos \left(\frac{A-B}{2} \right) \Rightarrow \sin 20^\circ + \sin 1^\circ =$$

$$2 \sin 15^\circ \cos 15^\circ = 2 \times \frac{1}{2} \times \cos 15^\circ = \cos 15^\circ$$

$$\Rightarrow \frac{\sqrt{2} \cos 15^\circ}{\cos 15^\circ} = \sqrt{2} \quad \text{P} \checkmark$$

$$\frac{(1 - 2 \sin^2 10^\circ)(2 \cos^2 15^\circ - 1)}{\frac{1}{2} \cos 10^\circ \cos 30^\circ} \left(\frac{1 - \tan^2 15^\circ}{1 + \tan^2 15^\circ} \right) \quad -A$$

$$\frac{\sin 10^\circ \cos 30^\circ \cos 30^\circ}{\sin 10^\circ} \Rightarrow \frac{1}{\cancel{\sin 10^\circ}} \sin 10^\circ = \frac{1}{\cancel{\sin 10^\circ}} \cos 10^\circ = \frac{1}{\cancel{\sin 10^\circ}} \cot 10^\circ \quad \text{P} \checkmark$$

$$\sin d + 2 \cos d = 2 \Rightarrow 2 \cos d - 2 \cos d = ? \quad -A$$

$$\sin d = 2 - 2 \cos d \quad | 2(2 \cos d - 1) - 2 \cos d =$$

$$\sin^2 d + \cos^2 d = 1 + 4 \cos^2 d - 4 \cos d + \cos^2 d \quad | 1 \cdot \cos^2 d - 2 - 4 \cos d =$$

$$1 = 1 + 4 \cos^2 d - 4 \cos d \quad | - \quad | 1 \cdot \cos^2 d - 4 \cos d - 2 =$$

$$1 \cdot \cos^2 d - 4 \cos d = -1$$

$$\Rightarrow 1 \cdot \cos^2 d - 4 \cos d - 2 = -1 \quad \text{P} \checkmark$$

$$\sin \hat{A} \sin \hat{C} = \cos^2 \hat{A} \quad \hat{B} = 110^\circ \Rightarrow \hat{A} = ? \quad -1.$$

$$\hat{A} + \hat{B} + \hat{C} = 180^\circ \rightarrow \hat{B} = 110^\circ \Rightarrow \hat{A} + \hat{C} = 180^\circ - 110^\circ = 70^\circ \Rightarrow \hat{C} = 70^\circ - \hat{A}$$

$$\sin 110^\circ \times \sin (70^\circ - \hat{A}) = \cos^2 \hat{A}$$

$$\frac{1}{2} [(\cos(A - 34^\circ) - \cos(110^\circ - A))] = \cos^2 \hat{A}$$

P ✓

$$\frac{1}{2} [\cos(A - 34^\circ) + \cos A] = \cos^2 \hat{A} \rightarrow \frac{1 + \cos A}{2}$$

$$\cos(A - 34^\circ) + \cos A = 1 + \cos A \Rightarrow \cos(A - 34^\circ) = 1$$

$$A - 34^\circ = 0 \Rightarrow \hat{A} = 34^\circ$$