

$$2\pi = (x) \text{ rad} \Rightarrow x = 2\pi \times \frac{\pi}{180} = \frac{\pi^2}{90} \quad 2\pi = \left(\frac{\pi^2}{90}\right) \text{ rad} \quad (1)$$

$$1\omega = (x) \text{ rad} \Rightarrow x = 1\omega \times \frac{\pi}{180} = \frac{\omega \pi}{180} \quad (2)$$

$$\frac{\omega \pi}{12} \text{ rad} = (x) \Rightarrow x = \frac{\omega \pi}{12} \times \frac{180}{\pi} = 15\omega \quad (3)$$

$$\frac{\pi}{9} \text{ rad} = (x) \Rightarrow x = \frac{\pi}{9} \times \frac{180}{\pi} = 20 \quad (4)$$

$$1 \text{ grad} = 0.9^\circ \quad \frac{1\omega a}{a} \text{ grad} = \frac{1\omega a}{a} \times 0.9 = \frac{1\omega a}{10} = \frac{2\omega a}{2} \quad (5)$$

$$\frac{a\pi}{18} \text{ rad} \quad \frac{a\pi}{18} \times \frac{180}{\pi} = \frac{10a}{2} \quad 10a + \frac{2\omega a}{2} + \frac{4\omega a}{2} = 180$$

$$10a + \frac{6\omega a}{2} = 180 \quad 10a = 180 \quad a = \frac{180}{10} = 18 \quad (a = 18)$$

$$\cos 90^\circ \cos 30^\circ - \sin 90^\circ \sin 30^\circ - \tan 45^\circ + 2 \cot 45^\circ = \text{اے} \quad (6)$$

$$\frac{1}{2} \times \frac{\sqrt{3}}{2} - \frac{\sqrt{3}}{2} \times \frac{1}{2} - 1 + 2(1) = 0 - 1 + 2 = 1$$

$$\frac{\tan^2 30^\circ + \tan^2 45^\circ + \tan^2 90^\circ}{\cot 30^\circ - \cot 90^\circ} = \frac{\frac{1}{3} + 1 + \infty}{\sqrt{3} - \frac{1}{\sqrt{3}}} =$$

$$\frac{\frac{1}{3}}{\frac{2\sqrt{3}-1}{3}} = \frac{\frac{1}{3}}{\frac{2\sqrt{3}}{3}} = \frac{1}{2\sqrt{3}}$$

$$-\sin 30^\circ \cos 90^\circ + \cos 30^\circ \sin 90^\circ = -\frac{1}{2} \times \frac{1}{2} + \frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2} = \frac{1}{2} \quad (7)$$

$$\sin \theta = \sqrt{\frac{1}{2}} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2} \quad \cos \theta = 1 - \sin \theta = 1 - \frac{1}{2} = \frac{1}{2}$$

$$\cos \theta = \frac{\sqrt{2}}{2} \quad \tan = \frac{\sin \theta}{\cos \theta} = \frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = 1$$

$$\tan \theta = \frac{2 \tan 30^\circ (1 - \tan^2 30^\circ)}{(1 - \cot^2 90^\circ)^2} = \frac{2 \times \frac{1}{\sqrt{3}} \times (1 - \frac{1}{3})}{(1 - \frac{1}{3})^2} = -\frac{2}{3}$$

$$\frac{\frac{2}{3}}{\frac{1}{9}} = \frac{2}{3} \times 9 = 6 \quad \frac{1}{\sqrt{2}} \quad \frac{\pi}{4} \quad (\theta = 45^\circ)$$

$$3 \sin \theta \cos \theta = 3 (\sin \theta \cos \theta) - \cos \theta = 1 \sin \theta \cos \theta - \cos \theta = -\frac{1}{2}$$

$$\sin \theta - 2 \cos \theta = \cos \theta - 2 \cos \theta = -\cos \theta \quad \frac{1 \cos \theta}{\cos \theta} = 1$$

$$10^2 = 9^2 + \cos^2 \alpha \quad 100 = 81 + \cos^2 \alpha \quad \cos^2 \alpha = 19 \quad \cos \alpha = \sqrt{19} \quad -\checkmark$$

$$\sin \alpha = \frac{9}{10} \quad \frac{\cos \alpha}{\sin \alpha} = \frac{10}{9} \quad \Rightarrow \quad \frac{10}{9} = 10 \quad \sqrt{19} + 9 + 10 + 19 = 48$$

$$\sqrt{19} + 19 = 10$$

$$DA \perp B = 90 \quad D = 30 \quad A \perp B \perp D = 90$$

$$A \perp B = A \perp D \times \cos(60) = 10 \times \frac{1}{2} = 5$$

$$B \perp A = A \perp D \times \sin(60) = 10 \times \frac{\sqrt{3}}{2} = 5\sqrt{3}$$

$$B \perp C = A \perp B \times \tan(60) = 5 \times \sqrt{3} = 5\sqrt{3}$$

$$D \perp C = B \perp D - B \perp C = 5\sqrt{3} - 5 = 5(\sqrt{3} - 1) = 3.66 \approx 3.7$$

$$\cos 90 = \sin \theta \cos \alpha \quad \sin 110 = \sin \theta \cos \alpha$$

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$$\cos 90 = \sin \theta \cos \alpha$$

$$\tan \alpha = \frac{\sin \alpha}{\cos \alpha} = \frac{1}{\sqrt{3}} \quad \sin^2 \alpha + \cos^2 \alpha = 1 \quad \sin \alpha = \frac{1}{\sqrt{3}} \times \cos \alpha$$

$$\left(\frac{1}{\sqrt{3}} \cos \alpha\right)^2 + \cos^2 \alpha = 1 \quad \left(\frac{1}{3}\right) \cos^2 \alpha + \cos^2 \alpha = 1$$

$$\cos^2 \alpha = \frac{3}{4} \quad \cos \alpha = \frac{\sqrt{3}}{2}$$

$$\sin \alpha = \left(\frac{1}{\sqrt{3}}\right) \cos \alpha = \frac{1}{\sqrt{3}} \times \frac{\sqrt{3}}{2} = \frac{1}{2}$$