

$$1) \quad 2V^\circ = (n) \text{ rad} \rightarrow \frac{2V}{180} = \frac{\text{rad}}{\pi} \rightarrow \text{rad} = \frac{2\pi}{V}$$

(1)

$$2) \quad 120^\circ = (n) \text{ rad} \rightarrow \frac{120}{180} = \frac{\text{rad}}{\pi} \rightarrow \text{rad} = \frac{2\pi}{3}$$

$$3) \quad \frac{2\pi}{15} \text{ rad} = (n)^\circ \rightarrow \frac{\frac{2\pi}{15}}{\frac{2\pi}{180}} = \frac{D}{180} \rightarrow D = 120^\circ$$

$$4) \quad \frac{2\pi}{9} \text{ rad} = (n)^\circ \rightarrow \frac{\frac{2\pi}{9}}{\frac{2\pi}{180}} = \frac{D}{180} \rightarrow D = 40^\circ$$

$$10a + \frac{20}{3}a + \frac{40}{3}a = \frac{30+20+40}{3} = \frac{90}{3}a = 30a = 180 \rightarrow a = 6$$

(2)

$$\frac{\frac{20a}{3}}{\frac{2\pi}{3}} = \frac{D}{180} \rightarrow D = \frac{20}{3}a, \quad \frac{\frac{40}{3}}{\frac{2\pi}{3}} = \frac{D}{180} \rightarrow D = \frac{40}{3}a$$

$$5) \quad \frac{\cos 30^\circ \cos 40^\circ - \sin 30^\circ \sin 40^\circ}{\sin 30^\circ \sin 40^\circ} = \frac{\tan 40^\circ + \tan 30^\circ}{1} = 0 \rightarrow 1 + 1 = 1$$

(3)

$$6) \quad \frac{\tan 30^\circ + \tan 40^\circ + \tan 50^\circ}{\tan 30^\circ \tan 40^\circ} = \left( \frac{1}{\sqrt{3}} + 1 + \sqrt{3} \right) = \left( \frac{1}{\sqrt{3}} + \frac{\sqrt{3}}{1} + \frac{1}{\sqrt{3}} \right) = \frac{1+3+1}{\sqrt{3}} = \frac{5}{\sqrt{3}}$$

$$\frac{\cos 30^\circ \cos 40^\circ - \sin 30^\circ \sin 40^\circ}{\sin 30^\circ \sin 40^\circ}$$

$$\frac{1}{\sqrt{3}} + \frac{\sqrt{3}}{1} + \frac{1}{\sqrt{3}}$$

$$7) \quad \sin 30^\circ \cos 40^\circ + \cos 30^\circ \sin 40^\circ = \sin \theta$$

(4)

$$-(\cos 30^\circ)^2 + (\sin 30^\circ)^2 = -\left(\frac{1}{2}\right)^2 + \left(\frac{\sqrt{3}}{2}\right)^2 = -\frac{1}{4} + \frac{3}{4} = \frac{2}{4} = \frac{1}{2} = \sin^2 \theta \rightarrow \sin \theta = \frac{\sqrt{2}}{2}$$

$$\tan \theta = 1 \rightarrow \theta = 45^\circ$$



$$\tan \alpha = \frac{1}{q} \rightarrow 1 + \tan^2 \alpha = \frac{1}{\cos^2 \alpha} \rightarrow 1 + \frac{1}{q^2} = \frac{1}{\cos^2 \alpha} = \frac{1}{\cos^2 \alpha} \rightarrow \cos^2 \alpha = \frac{q^2}{1+q^2}$$

$$\rightarrow \cos^2 \alpha + \sin^2 \alpha = 1 \rightarrow \frac{q^2}{1+q^2} + \sin^2 \alpha = 1 \rightarrow \sin^2 \alpha = \frac{1}{1+q^2} \rightarrow \sin \alpha = \frac{1}{\sqrt{1+q^2}}$$

$$\rightarrow \sin \alpha = \frac{1}{\sqrt{1+q^2}} = \frac{1}{\sqrt{1+q^2}}$$