

Questions from Homework

$$⑤ b) \sin^2 \theta + \frac{1}{2} \sin \theta = 0$$

$$\sin \theta \left(\sin \theta + \frac{1}{2} \right) = 0$$

$$\sin \theta = 0$$

$$\theta = 0^\circ, 180^\circ, 360^\circ$$

$$0^\circ + 360^\circ k, k \in \mathbb{I}$$

$$180^\circ + 360^\circ k, k \in \mathbb{I}$$

$$\sin \theta + \frac{1}{2} = 0$$

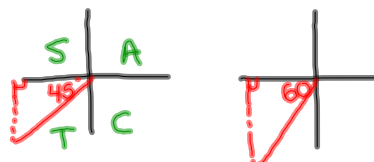
$$\sin \theta = -\frac{1}{2} \quad \text{ref} = 30^\circ$$

$$\theta = 210^\circ, 330^\circ$$

$$210^\circ + 360^\circ k, k \in \mathbb{I}$$

$$330^\circ + 360^\circ k, k \in \mathbb{I}$$

$$⑥ d) \frac{\cos 225^\circ}{\sin 240^\circ + \cos 60^\circ}$$



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

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

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

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

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

$$\frac{-\sqrt{2} - \sqrt{6}}{1-3}$$

$$\frac{-\sqrt{2} - \sqrt{6}}{-2}$$

$$\boxed{\frac{\sqrt{2} + \sqrt{6}}{2}}$$

Trig Identities

$$\tan \theta = \frac{\sin \theta}{\cos \theta}$$

$$\cot \theta = \frac{\cos \theta}{\sin \theta}$$

$$\csc \theta = \frac{1}{\sin \theta}$$

$$\sec \theta = \frac{1}{\cos \theta}$$

$$\cot \theta = \frac{1}{\tan \theta}$$

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

$$\tan^2 \theta + 1 = \sec^2 \theta$$

$$1 + \cot^2 \theta = \csc^2 \theta$$

$$\sin \theta = \frac{1}{\csc \theta}$$

$$\cos \theta = \frac{1}{\sec \theta}$$

$$\tan \theta = \frac{1}{\cot \theta}$$

$$\sin(x + y) = \sin x \cos y + \cos x \sin y$$

$$\sin(x - y) = \sin x \cos y - \cos x \sin y$$

$$\cos(x + y) = \cos x \cos y - \sin x \sin y$$

$$\cos(x - y) = \cos x \cos y + \sin x \sin y$$

$$\sin 2\theta = 2 \sin \theta \cos \theta$$

$$\cos 2\theta = \cos^2 \theta - \sin^2 \theta$$

$$\frac{1}{1+\sin\theta} + \frac{1}{1-\sin\theta} = 2\underline{\sec^2\theta}$$

$$\frac{1-\sin\theta + (1+\sin\theta)}{(1+\sin\theta)(1-\sin\theta)} \quad \left| \quad \frac{\partial}{\partial} \left(\frac{1}{\cos^2\theta} \right)$$

$$\frac{\partial}{\partial} \underline{1-\sin^2\theta}$$

$$\boxed{\frac{\partial}{\partial} \cos^2\theta}$$

$$\boxed{\frac{\partial}{\partial} \cos^2\theta}$$

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

$$\frac{1 - (\cos^2 \theta - \sin^2 \theta)}{1 + (\cos^2 \theta - \sin^2 \theta)}$$

$$\frac{1 - \cos^2 \theta + \sin^2 \theta}{1 + \cos^2 \theta - \sin^2 \theta}$$

$$\frac{\sin^2 \theta + \sin^2 \theta}{\cos^2 \theta + \cos^2 \theta}$$

$$\frac{\cancel{2} \sin^2 \theta}{\cancel{2} \cos^2 \theta}$$

$$\frac{\sin^2 \theta}{\cos^2 \theta}$$

$$\frac{\sin^2 \theta}{\cos^2 \theta}$$

$$\tan^3 \theta \sec^2 \theta - \tan^3 \theta = \tan^5 \theta$$

$$\tan^3 \theta (\underline{\sec^2 \theta - 1}) \quad | \quad \boxed{\tan^5 \theta}$$

$$\tan^3 \theta (\tan^2 \theta)$$

$$\boxed{\tan^5 \theta}$$

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

$$\frac{(\cos x - \sin x) \cancel{(\cos x + \sin x)}}{\cos x (\cancel{\cos x + \sin x})}$$

$$\frac{\cos x - \sin x}{\cos x}$$

