



## 9.5 ත්‍රිකෝණමිතික ශ්‍රිත විවරණය කරයි.

(අභ්‍යාස සහ පිළිතුරු)





## 9.5.1. ත්‍රිකෝණමිතික සමීකරණ හඳුනාගැනීම

පහත ත්‍රිකෝණමිතික සමීකරණවල සාධාරණ විසඳුම් සොයන්න.

1.  $\sin \theta + \sin 3\theta + \sin 5\theta = 0$
2.  $2\sin^2 \theta + 3\cos \theta = 0$
3.  $\tan \theta + \tan 2\theta + \tan 3\theta = \tan \theta \cdot \tan 2\theta \cdot \tan 3\theta$
4.  $\tan^2 \theta + (1 - \sqrt{3}) \tan \theta - \sqrt{3} = 0$
5.  $7 \cos^2 \theta + 3 \sin^2 \theta = 4$



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1.

$$\begin{aligned} \sin \theta + \sin 3\theta + \sin 5\theta &= 0 \\ \sin 3\theta + 2 \sin(3\theta) \cos(-2\theta) &= 0 \\ \sin 3\theta[1 + 2 \cos(2\theta)] &= 0 \\ \sin 3\theta = 0 \text{ හෝ } \cos 2\theta &= -\frac{1}{2} \\ 3\theta = n\pi, n \in \pi \text{ හෝ } \cos 2\theta &= -\frac{1}{2} \\ \theta = n\frac{\pi}{3}, n \in \pi \text{ හෝ } \cos 2\theta &= \cos\left(\pi - \frac{\pi}{3}\right) \\ \cos 2\theta &= \cos\left(\frac{2\pi}{3}\right) \\ 2\theta &= 2n\pi \mp \left(\frac{2\pi}{3}\right) \end{aligned}$$





2.

$$2\sin^2\theta + 3\cos\theta = 0$$

$$2(1 - \cos^2\theta) + 3\cos\theta = 0$$

$$2 - 2\cos\theta + 3\cos\theta = 0$$

$$2\cos^2\theta - 3\cos\theta = 0$$

$$2\cos^2\theta - 4\cos\theta + \cos\theta - 2 = 0$$

$$2\cos\theta(\cos\theta - 2) + (\cos\theta - 2) = 0$$

$$(\cos\theta - 2)(2\cos\theta + 1) = 0$$

$$\cos\theta = 2 \text{ හෝ } \cos\theta = -\frac{1}{2}$$

$\cos\theta = 2$  වසදුම පිළිගත නොහැකි ය.  $-1 \leq \cos 2\theta \leq 1$  නිසා

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

$$\cos\theta = \cos\left(\pi - \frac{\pi}{3}\right)$$

$$\cos\theta = \cos\left(\frac{2\pi}{3}\right), n \in \pi$$





3.

$$\begin{aligned} \tan \theta + \tan 2\theta + \tan 3\theta &= \tan \theta \cdot \tan 2\theta \cdot \tan 3\theta \\ \tan \theta + \tan 2\theta &= \tan \theta \cdot \tan 2\theta \cdot \tan 3\theta - \tan 3\theta \\ \tan \theta + \tan 2\theta &= -\tan 3\theta (1 - \tan \theta \cdot \tan 2\theta) \\ \frac{\tan \theta + \tan 2\theta}{1 - \tan \theta \cdot \tan 2\theta} &= -\tan 3\theta \\ \tan(\theta + 2\theta) &= -\tan 3\theta \\ \tan(3\theta) &= -\tan 3\theta \\ 2 \tan(3\theta) &= 0 \\ \tan(3\theta) &= 0 \\ 3\theta &= n\pi, n \in \pi \\ \theta &= \underline{\underline{n \frac{\pi}{3}}} \end{aligned}$$





4.

$$\tan^2 \theta + (1 - \sqrt{3}) \tan \theta - \sqrt{3} = 0$$

$$\tan^2 \theta + \tan \theta - \sqrt{3} \tan \theta - \sqrt{3} = 0$$

$$\tan \theta (\tan \theta + 1) - \sqrt{3} (\tan \theta + 1) = 0$$

$$(\tan \theta + 1) (\tan \theta - \sqrt{3}) = 0$$

$$(\tan \theta + 1) (\tan \theta - \sqrt{3}) = 0$$

$$(\tan \theta + 1) = 0 \text{ හෝ } (\tan \theta - \sqrt{3}) = 0$$

$$\tan \theta = -1 \text{ හෝ } \tan \theta = \sqrt{3}$$

$$\tan \theta = -\tan\left(\frac{\pi}{4}\right)$$

$$\tan \theta = \tan\left(\frac{\pi}{3}\right)$$

$$\tan \theta = \tan\left(-\frac{\pi}{4}\right)$$

$$\theta = n\pi + \left(\frac{\pi}{3}\right), n \in \pi$$

$$\theta = n\pi + \left(-\frac{\pi}{4}\right), n \in \pi$$

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5.

$$7\cos^2\theta + 3\sin^2 = 4$$

$$7(1 - \sin^2\theta) + 3\sin^2 = 4$$

$$7 - 7\sin^2\theta + 3\sin^2\theta = 4$$

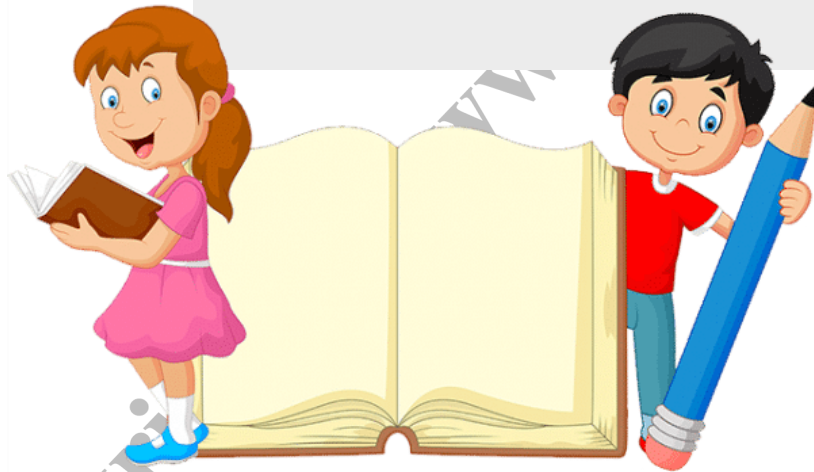
$$-4\sin^2\theta = -3$$

$$\sin^2\theta = \frac{3}{4}$$

$$\sin^2\theta = \left(\frac{\sqrt{3}}{2}\right)^2$$

$$\sin^2\theta = \sin^2\left(\frac{2}{3}\right)$$

$$\underline{\underline{Q = n\pi \pm \frac{2}{3}, n \in \pi}}$$





$$(I) \cos^2\theta + \frac{3}{\sin\theta} + 3 = 0$$

$$(II) \tan\theta + \tan 2\theta + \tan\theta \cdot \tan 2\theta = 1$$

$$(III) \sin 2\theta + \sin 4\theta + \sin 6\theta = 0$$

$$(IV) \tan 2\theta + \tan 2\theta + \tan 3\theta = 0$$

$$(V) \cos\theta \cdot \cos 2\theta \cdot \cos 3\theta = \frac{1}{4}$$

$$(VI) \sin^6\theta + \cos^6\theta = \frac{7}{16}$$

