

Related angles_10

Saturday, November 1, 2025 12:08 AM

6 Solve the equation: $\sin 2\theta = \cos \theta$

$\therefore 2\theta + \theta = 90$ ← solve

$$\frac{3\theta}{3} = \frac{90}{3}$$

$$\theta = 30$$

$$A \pm B = \frac{\pi}{2} + 2\pi n$$

9 Find the general solution of each of the following equations:

A $\sin 4\theta = \cos 2\theta$

B $2\sin(\frac{\pi}{2} - \theta) = 1$

C $\cos 5\theta = \sin \theta$

$$4\theta + 2\theta = \frac{\pi}{2} + 2\pi n$$

$$\frac{6\theta}{6} = \frac{\pi}{2} + \frac{2\pi n}{3}$$

$$\theta = \frac{\pi}{12} + \frac{\pi}{3} n$$

B $2\sin(\frac{\pi}{2} - \theta) = \frac{1}{2}$

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

$\sin(\frac{\pi}{2} - \theta) = \cos 60$

$$\frac{\pi}{2} - \theta + \frac{\pi}{3} = \frac{\pi}{2} + 2\pi n$$

$$\frac{5\pi}{6} - \theta = \frac{\pi}{2} + 2\pi n$$

$$-\theta = \frac{\pi}{2} - \frac{5\pi}{6} + 2\pi n$$

$$-\theta = -\frac{1}{3}\pi + 2\pi n$$

$$\theta = \frac{\pi}{3} - 2\pi n$$

Related angles_11

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(47) If $\sin \alpha = \cos \beta$... (a) 1 (b) -1 (c) zero

(48) If $\sin \theta = \cos 2\theta$, $\theta \in]0, \frac{\pi}{2}[$, then $\sin 3\theta = \dots$ (a) $\frac{1}{2}$ (b) 1 (c) zero

(49) If $\sin 2\theta = \cos 4\theta$ where θ is a positive acute angle, then $\tan(90^\circ - 3\theta) = \dots$ (a) -1 (b) $\frac{1}{\sqrt{3}}$ (c) 1 (d) $\sqrt{3}$

(50) If $\tan \theta = \cot 2\theta$, $0^\circ < \theta < 90^\circ$, then $\sin \theta + \cos 2\theta = \dots$ (a) 1 (b) -1 (c) 2 (d) $\frac{1}{4}$

(51) If $\sin(\theta + 13^\circ) = \cos(\theta + 17^\circ)$ where θ is a positive acute angle, then $\tan \theta = \dots$ (a) $\sqrt{3}$ (b) $\frac{1}{2}$ (c) $\frac{1}{\sqrt{3}}$ (d) $\frac{\sqrt{3}}{2}$

$\sin \theta + \cos 2\theta = ??$

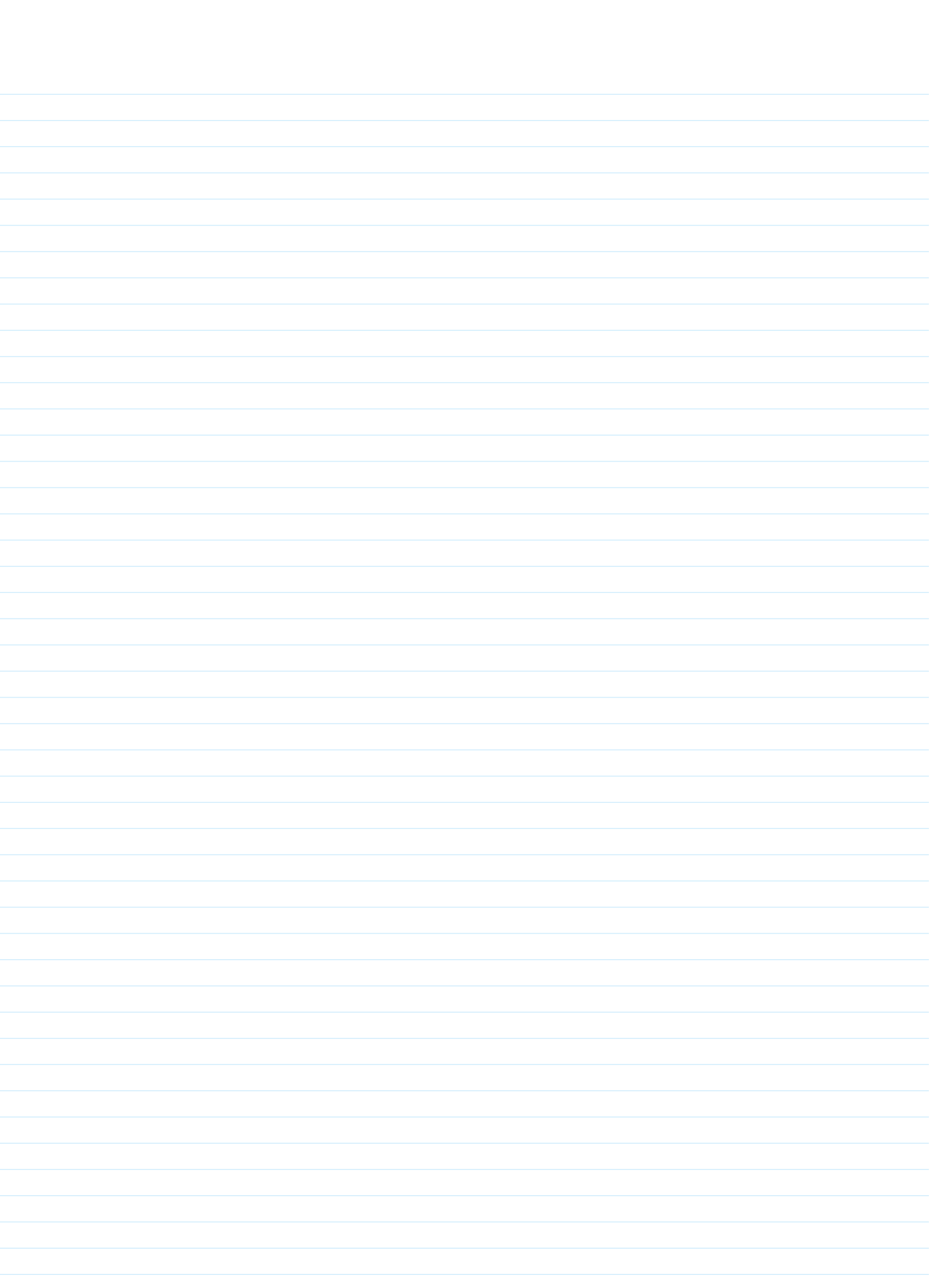
(50) $\theta + 2\theta = 90^\circ \Rightarrow 3\theta = 90 \Rightarrow \theta = 30$
 $\sin 30 + \cos 60 = \frac{1}{2} + \frac{1}{2} = 1$

$\sin 2\theta = \cos 4\theta$ (with $2\theta + 4\theta = 90$ written above)

$\tan(90 - 3\theta) = ?$

$2\theta + 4\theta = 90$
 $6\theta = 90 \Rightarrow \theta = 15$

$\tan(90 - 45) = \tan 45 = 1$



Related angles_12

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If $\sin(2\theta + 15^\circ) = \cos(\theta + 30^\circ)$, where $0^\circ < \theta < 90^\circ$

, find the value of : $\csc^2 2\theta + \cot^2 3\theta + \sec^2 4\theta$

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$$2\theta + 15 + \theta + 30 = 90$$

$$3\theta + 45 = 90 \quad -45$$

$$\frac{3\theta}{3} = \frac{45}{3}$$

$\theta = 15$

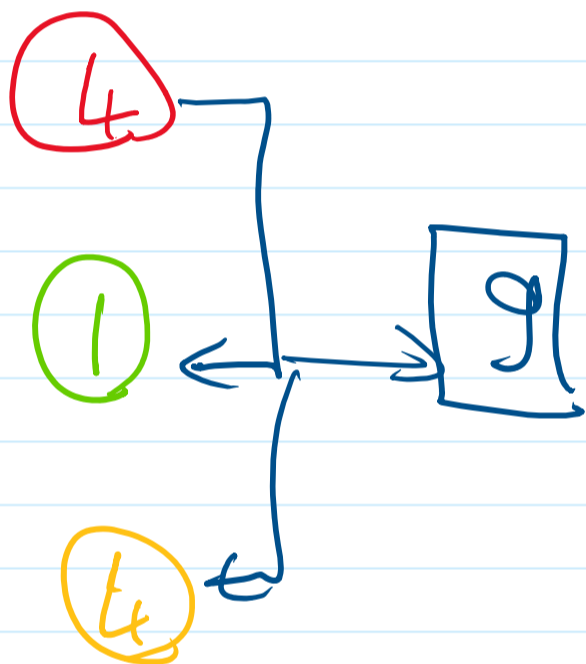
$$\csc^2 2\theta + \cot^2 3\theta + \sec^2 4\theta$$

$$\csc^2 30 + \cot^2 45 + \sec^2 60$$

$$\csc 30 = \frac{1}{\sin 30} = \frac{1}{\frac{1}{2}} = 2$$

$$\cot 45 = \frac{1}{\tan 45} = 1$$

$$\sec 60 = \frac{1}{\cos 60} = \frac{1}{\frac{1}{2}} = 2$$



5 → 6

$$\sin \theta = \frac{2}{3} \quad \text{flip}$$

$$\cos \theta = \frac{\sqrt{5}}{3}$$

$$\sec(-\theta)$$

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

$$\cos \theta = \cos(-\theta)$$

$$\sec \theta = \frac{3}{\sqrt{5}} * \frac{\sqrt{5}}{\sqrt{5}} = \frac{3\sqrt{5}}{5}$$