

Quiz 10: Solving Trigonometric Equations, Pythagorean Identity, and Verifying Trig Identities

There's a Ghost in My Calculator

Cthulhu Lemon

1. **If $\sin(\theta) = \frac{16}{34}$ and θ is in Quadrant II, what is $\sin\left(\frac{\theta}{2}\right)$?** Type an exact answer, using radicals as needed. Simplify your answer completely and rationalize the denominator.
2. **Solve the equation $2\cos(2x) + 12\cos(x) + 7 = 0$ on the interval $0 \leq x < 2\pi$.** Enter an exact answer in terms of π .
3. **Given that $\sin(\theta) = \frac{12}{13}$, and θ is in Quadrant II, what is $\cos(2\theta)$?** Give an exact answer in the form of a fraction.
4. **You are given that $\cos(A) = \frac{15}{17}$, with A in Quadrant IV, and $\cos(B) = \frac{4}{5}$, with B in Quadrant IV. Find $\cos(A - B)$.** Give your answer as a fraction.

5. For all values of θ for which the expression is defined, what is $\frac{\cos(2\theta)}{\tan^2 \theta}$?
6. For all values of α and β for which the expression is defined, what is $\frac{\cos(\alpha+\beta)}{\sin \beta}$?
7. Compute the exact value of $\tan\left(\frac{17\pi}{12}\right)$.
8. If $0 \leq x < 2\pi$, find all values of x that satisfy the equation

$$\cos^3\left(-\frac{x}{2}\right)\tan^2 x + \cos^3\left(-\frac{x}{2}\right) = \frac{\sqrt{3}}{2}$$

Enter an exact answer, in terms of π .

9. Compute the exact value of $\sin\left(\frac{25\pi}{12}\right)$.

10. Solve the following equation for x , where $0 \leq x < 2\pi$:

$$\cos(2x) + 8 \cos x - 9 = 0$$