

PreCalculus Test

Your Name:

(1-3) Simplify the expression.

1. $\tan^2 x - \sec^2 x$

2. $\cos\left(\frac{\pi}{2} - x\right) + \frac{1}{\csc(-x)}$

3. $\frac{\sin 10x}{1 + \cos 10x}$

(4-7) Use the appropriate formula to find the exact value of the expression.

4. $\cos 105^\circ$

5. $\sin 41^\circ \cos 169^\circ + \cos 41^\circ \sin 169^\circ$

6. $\sin \frac{\pi}{8}$

7. $8 \sin 7.5^\circ \cos 52.5^\circ$

8. Evaluate using the Pythagorean identities. Show all work.

Find $\sin \theta$ and $\cos \theta$ if $\tan \theta = -8/3$ and $\sin \theta < 0$.

9. Find $\sin 2x$, $\cos 2x$, and $\tan 2x$ from the given information.

$\sec x = 4$, x in quadrant IV

10. Use the formulas for lowering powers to rewrite the expression in terms of the first power of cosine.

$\cos^6 x$

11. Find $\sin \frac{x}{2}$, $\cos \frac{x}{2}$, and $\tan \frac{x}{2}$ from the given information.

$\tan x = 1$, $0 < x < \pi/2$

12. Write the sum as a product.

$$\sin 5x + \sin 6x$$

(13-15) Solve.

13. $(2 \cos x - \sqrt{2}) \sec x = 0$

14. $\tan 3x = -\sqrt{3}$

15. $\sin^2 x = -3 \sin x - 2$

(16-18) Verify (prove) the identity. Show all work and justify steps if necessary.

16. $(\csc x + 1)(\csc x - 1) = \cot^2 x$

17. $\cos^2 x \csc x - \csc x = \cos\left(\frac{\pi}{2} + x\right)$

18. $\frac{\sin 3x + \cos 3x}{\cos x - \sin x} = 1 + 2 \sin 2x$