

For questions 1 – 3, use identities and/or factoring to simplify each expression.

1.  $\frac{\sin^2 \beta \cot \beta}{\cos \beta}$

2.  $\sin(x) - \sin(x)\cos^2(x)$

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

For questions 4 – 8, verify that each of the following is an identity.

4.  $\frac{\cos^2 \theta}{\sin^2 \theta} + \csc \theta \sin \theta = \csc^2 \theta$

5.  $\frac{1}{1 - \sin x} + \frac{1}{1 + \sin x} = 2 \sec^2 x$

6.  $\frac{1 + \cos 2\alpha}{\sin 2\alpha} = \cot \alpha$

7.  $\cos\left(\frac{\pi}{2} - x\right) = \sin x$

8.  $\sin\left(\frac{3\pi}{2} + x\right) = -\cos x$

**For questions 9 – 13, use identities to find the exact value of each function.**

9.  $\sin(105^\circ)$

10.  $\tan\left(-\frac{\pi}{12}\right)$

11.  $\cos(50^\circ)\cos(20^\circ) + \sin(50^\circ)\sin(20^\circ)$

12.  $1 - 2\sin^2\left(\frac{\pi}{8}\right)$

13.  $\frac{2\tan 75^\circ}{1 - \tan^2 75^\circ}$

**For questions 14 – 16, if  $\sin A = \frac{3}{5}$  and A is in the second quadrant, find each value.**

14.  $\cos(2A)$

15.  $\sin(2A)$

16.  $\tan(2A)$

**For questions 17 – 20, solve each equation for  $[0, 2\pi)$ .**

17.  $2\cos^2(x) - 5\cos(x) + 3 = 0$

18.  $\cos^2(x) + 4\sin(x) + 4 = 0$

19.  $\cos(2x) - 2\sin^2(x) = 0$

20.  $4\cos^2(x) - 3 = 0$

**For question 21, solve for all values.**

21.  $2\tan(x)\sin(x) + \tan(x) = 0$

**For questions 22 and 23, find the area of each triangle to the nearest tenth.**

22.  $a = 5, b = 12, c = 13$

23.  $c = 3.58, b = 6.8, A = 39^\circ$

**For questions 24 and 25, solve each triangle. Round your FINAL answer to the nearest tenth.**

24.  $b = 40, c = 45, A = 51^\circ$

25.  $c = 125, b = 150, C = 25^\circ$

**Previous chapter review**

**For questions 26 – 31, find each EXACT value.**

26.  $\sin\left(\frac{5\pi}{6}\right)$

27.  $\cos\left(-\frac{5\pi}{4}\right)$

28.  $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)$

29.  $\tan^{-1}(0)$

30.  $\tan\left[\arcsin\left(\frac{\sqrt{3}}{2}\right)\right]$

31.  $\cos\left[\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right)\right]$

32. Graph:  $y = \frac{1}{2} \sin 2\left(x + \frac{\pi}{8}\right) + 3$ . Label axes. State the amplitude, period, phase shift, and vertical shift.

33. Write an equation using the cosine function from the given information. Sketch a graph of the curve.

amplitude = 3, period =  $\pi$ , phase shift =  $-\frac{\pi}{2}$ , vertical shift = -5.