

Chapter Test

Form A

Chapter 14

Simplify each trigonometric expression.

1. $\csc \theta \tan \theta$
2. $\sec \theta (\sec \theta - \cos \theta)$
3. $-\cos^2 \theta - \sin^2 \theta$
4. $\frac{1 + \tan^2 \theta}{\sec \theta}$

Verify each identity.

5. $\tan \theta (\cot \theta + \tan \theta) = \sec^2 \theta$
6. $\sec \theta \sin \theta \cot \theta = 1$
7. $\cos^2 \theta \csc^2 \theta + \cos^2 \theta \sec^2 \theta = \csc^2 \theta$
8. $\cot \theta \cos \theta + \sin \theta = \csc \theta$

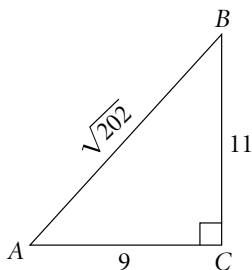
Use a unit circle and 30° - 60° - 90° triangles to find the value in degrees of each expression.

9. $\cos^{-1}\left(\frac{1}{2}\right)$
10. $\tan^{-1}\left(\frac{1}{\sqrt{3}}\right)$
11. $\sin^{-1}\left(-\frac{1}{2}\right)$
12. $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)$

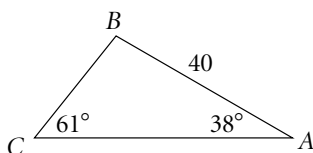
Solve each equation for $0 \leq \theta < 2\pi$.

13. $2 \sin \theta + \sqrt{3} = 0$
14. $\sqrt{2} \cos \theta = 1$
15. $3 \tan \theta = \sqrt{3}$
16. $8 \cos \theta - 4 = 4 \cos \theta$

In $\triangle ABC$, find each value as a fraction and as a decimal. Round to the nearest hundredth.



17. $\sin A$
18. $\cos A$
19. $\tan B$
20. $\csc A$
21. $\sec B$
22. $\cot B$
23. In $\triangle FGH$, $\angle G$ is a right angle. Find h if $f = 11$ and $g = 13$. Round your answer to the nearest tenth.
24. Find the area of $\triangle ABC$ if $m\angle A = 35^\circ$, $b = 15$ cm and $c = 12$ cm. Round your answer to the nearest tenth.
25. Find a using the triangle below. Round your answer to the nearest whole number.



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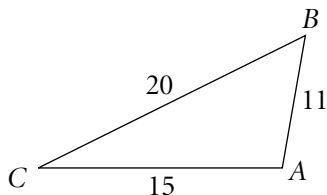
Chapter Test (continued)

Form A

Chapter 14

26. In $\triangle GHI$ if $m\angle G = 25^\circ$, $i = 8$ in. and $g = 10$ in. Find $m\angle I$ to the nearest tenth.

Find each value using the triangle below. Express answers to the nearest whole degree.



27. $m\angle A$

28. $m\angle B$

29. $m\angle C$

Verify each identity.

30. $\cos\left(\theta + \frac{\pi}{2}\right) = -\sin \theta$

31. $\sec\left(\theta + \frac{\pi}{2}\right) = -\csc \theta$

32. $\tan\left(-\frac{\pi}{2} + \theta\right) = -\cot \theta$

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

Solve each trigonometric equation for $0 < \theta \leq 2\pi$.

34. $2 \cos\left(\frac{\pi}{2} - \theta\right) = \sqrt{3}$

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

36. $\sec\left(\frac{\pi}{2} - \theta\right) = \sec \theta$

37. $\sqrt{2} \sin\left(\frac{\pi}{2} - \theta\right) = -1$

38. Use a double-angle identity to find the exact value of $\sin 120^\circ$.

39. Use a half-angle identity to find the exact value of $\cos 15^\circ$.

40. **Open-Ended** Write an equation involving sine, cosine, or tangent that has solutions of $\frac{\pi}{4}$ or $\frac{7\pi}{4}$ for $0 \leq \theta < 2\pi$.

41. **Writing** Explain why the Law of Cosines, rather than the Law of Sines, is used to find an angle in a triangle if three sides of the triangle are given.