SM 3H

6.4 Trigonometric Functions and the Unit Circle

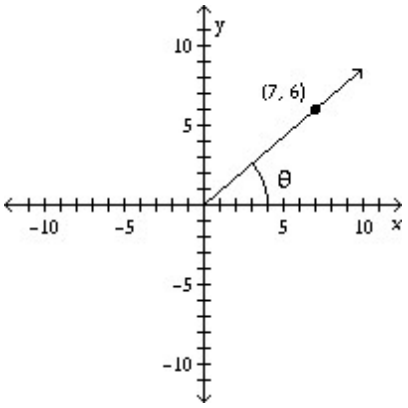
2023-2024

SCORE: /

Name _____ Date _____ Period _____

Find the exact values of $\sin\theta$, $\cos\theta$, $\tan\theta$, $\csc\theta$, $\sec\theta$, and $\cot\theta$ where θ is an angle in standard position whose terminal side contains the given point. Write answers in simplest form.

1.



2. $(-9, 5)$

3. $(-3, -2)$

Find the exact value of the following expression without using a calculator or the unit circle. Must show reference triangle to receive credit. Some of the expressions are undefined.

4. $\sin\left(-\frac{\pi}{2}\right)$

5. $\cos 90°$

6. $\tan 270°$

7. $\cot(-\pi)$

8. $\csc\left(\frac{5\pi}{2}\right)$

9. $\sin\left(\frac{\pi}{4}\right)$

10. $\cos 45°$

11. $\tan\left(-\frac{\pi}{4}\right)$

12. $\sec\left(\frac{7\pi}{4}\right)$

13. $\cos 135°$

14. $\sin 30°$

15. $\cot\left(\frac{5\pi}{6}\right)$

16. $\csc\left(\frac{13\pi}{6}\right)$

17. $\sin\left(\frac{5\pi}{3}\right)$

18. $\sec(-120°)$

19. $\csc\left(-\frac{4\pi}{3}\right)$

Use a calculator to find the function value to the nearest ten-thousandth. Be sure you have the calculator in the correct mode.

20. $\sin(74°)$

21. $\cos(9°23')$

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

Find the exact value of the expression. Do not use a calculator!

23. $\frac{\cos\left(\frac{7\pi}{6}\right)}{\sin\left(\frac{7\pi}{6}\right)}$

24. $\sin\left(\frac{\pi}{4}\right)+\cos\left(\frac{\pi}{4}\right)$

25. $\sin\left(\frac{\pi}{2}+\frac{\pi}{6}\right)$

26. $\frac{1-\sin\left(\frac{5\pi}{3}\right)}{\cos\left(\frac{5\pi}{3}\right)}$

27. $\cos 2\theta$ if $\theta=\frac{\pi}{6}$

28. $\sin 2\theta$ if $\theta=\frac{3\pi}{2}$

Find the exact value of the expression. Do not use a calculator.

29. $\csc\theta$, if $\sin\theta=\frac{3}{4}$

30. $\sec\theta$, if $\sin\theta=-\frac{3}{5}$ and $\cos\theta<0$

31. $\sin\theta$, if $\cos\theta=\frac{2}{3}$ and $\cot\theta>0$

32. $\sec\theta$, if $\cot\theta=-\frac{4}{3}$ and $\cos\theta<0$

33. $\tan\theta$, if $\sin\theta=-\frac{2}{5}$ and $\cos\theta>0$

34. $\cos\theta$, if $\sin\theta=-1$

Find the quadrant that contains the terminal side of angle θ.

35. $\csc\theta>0$ and $\cot\theta>0$

36. $\sin\theta<0$ and $\tan\theta>0$

Review

37. Convert $\frac{13\pi}{12}$ radians to a degree measure.

38. A sector of a circle with radius 8 meters has a central angle of $\frac{\pi}{8}$. Find the area of the sector to the nearest tenth of a square meter. Show work.

39. A 30-inch lawnmower blade is rotating at 2000 revolutions per minute. Find the linear velocity of the tip of the blade in miles per hour to the nearest tenth.

Find the exact value of each trig functions without a calculator or a unit circle. Must show reference triangle for credit.

40. $\csc 0°$

41. $\tan\left(\frac{\pi}{6}\right)$

42. $\sin 60°$

43. $\cos\left(\frac{2\pi}{3}\right)$

44. $\sec\left(\frac{3\pi}{4}\right)$

45. $\cot 150°$

46. $\sec\left(\frac{7\pi}{6}\right)$

47. $\tan 225°$

48. $\csc 240°$

49. $\cot\left(\frac{5\pi}{3}\right)$

50. $\sin 315°$

51. $\cos\left(\frac{11\pi}{6}\right)$