

1. Which angle is not coterminal with -30° ?
 A. $-\frac{\pi}{6}$ B. -750° C. $\frac{35\pi}{6}$ D. 750° 1. _____
2. Evaluate $\cos\left(\sin^{-1}\frac{\sqrt{3}}{2}\right)$.
 A. $\frac{\sqrt{3}}{2}$ B. $\frac{1}{2}$ C. $\sqrt{3}$ D. $\frac{\sqrt{2}}{2}$ 2. _____
3. Write the polynomial equation of least degree with roots $7i$ and $-7i$.
 A. $x^2 + 49 = 0$ B. $x^2 - 49x = 0$
 C. $x^2 - 7 = 0$ D. $x^2 + 7 = 0$ 3. _____
4. Find the x -intercepts of the graph of the function
 $f(x) = (x - 3)(x^2 + 4x + 3)$.
 A. 3, 1 B. -9 C. -3, -1, 3 D. 9, -9 4. _____
5. Find the discriminant of $4m^2 + 2m + 1 = 0$ and describe the nature of the roots of the equation.
 A. -12, imaginary B. 12, real
 C. 4, imaginary D. 2, real 5. _____
6. Solve $\sin \theta = -1$ for all values of θ . Assume k is any integer.
 A. $90^\circ + 360k^\circ$ B. $180^\circ + 360k^\circ$ C. $360k^\circ$ D. $270^\circ + 360k^\circ$ 6. _____
7. List all possible rational roots of $f(x) = 2x^3 + 5x^2 + 4x + 3$.
 A. $\pm 1, \pm 2$ B. $\pm 1, \pm 3, \pm \frac{1}{2}, \pm \frac{3}{2}$
 C. $\pm 1, \pm 2, \pm 3, \pm \frac{2}{3}$ D. $\pm 1, \pm 3$ 7. _____
8. A section of highway is 4.2 kilometers long and rises at a uniform grade making a 3.2° angle with the horizontal. What is the change in elevation of this section of highway to the nearest thousandth?
 A. 0.235 km B. 0.013 km C. 4.193 km D. 0.234 km 8. _____

9 Use the Remainder Theorem to find the remainder for $(2x^3 - 5x^2 + 3x + 4) \div (x - 2)$. 9 _____
A. -6 **B.** 6 **C.** 2 **D.** 0

10. If \vec{v} has magnitude 6 kilometers, \vec{w} has magnitude 18 kilometers, and both vectors have the same direction, which of the following is true? 10 _____
A. $\vec{v} = 3\vec{w}$ **B.** $3\vec{v} = \vec{w}$ **C.** $\vec{v} = \vec{w}$ **D.** $3\vec{v} = 18\vec{w}$

11 Find the magnitude of \overline{AB} for $A(8, 8)$ and $B(-7, 3)$. 11 _____
A. $5\sqrt{10}$ **B.** $\sqrt{26}$ **C.** $10\sqrt{2}$ **D.** $\sqrt{123}$

12 Change 54° to radian measure in terms of π . 12 _____
A. $\frac{5\pi}{4}$ **B.** $\frac{3\pi}{10}$ **C.** $\frac{\pi}{4}$ **D.** $\frac{4\pi}{9}$

13 Find one positive and one negative angle that are coterminal with an angle measuring $\frac{\pi}{6}$. 13 _____
A. $\frac{\pi}{4}, -\frac{3\pi}{2}$ **B.** $\frac{13\pi}{6}, -\frac{11\pi}{6}$ **C.** $\frac{7\pi}{6}, -\frac{5\pi}{6}$ **D.** $\frac{2\pi}{3}, -\frac{2\pi}{3}$

14 Simplify $\sec \theta - \tan \theta \sin \theta$. 14 _____
A. $\cos \theta$ **B.** $\sin \theta$ **C.** $\sec \theta$ **D.** $\csc \theta$

15 If $\sin \theta = -\frac{1}{2}$ and θ lies in Quadrant III, find $\cot \theta$. 15 _____
A. $-\frac{\sqrt{3}}{3}$ **B.** $\frac{\sqrt{3}}{3}$ **C.** $\sqrt{3}$ **D.** $-\sqrt{3}$

16 State the amplitude, period, and phase shift of the function $y = 2 \sin\left(3x - \frac{\pi}{3}\right)$. 16 _____
A. 2, 3, $\frac{\pi}{2}$ **B.** 3, 3, π **C.** 2, $\frac{2\pi}{3}, \frac{\pi}{9}$ **D.** 2, $\frac{3}{2\pi}, \frac{\pi}{9}$

17 Find the value of $\text{Cos}^{-1}\left(\sin \frac{\pi}{2}\right)$. 17 _____
A. 0 **B.** $\frac{\pi}{2}$ **C.** π **D.** $\frac{3\pi}{2}$

18 Which equation is a trigonometric identity? 18 _____
A. $\cos 2\theta = \cos^2 \theta - \sin^2 \theta$ **B.** $\cos^2 \theta - \sin^2 \theta = 1$
C. $\sin 2\theta = \sin \theta \cos \theta$ **D.** $\cos(-\theta) = -\cos \theta$

19 If α is a first quadrant angle and $\cos \alpha = \frac{\sqrt{10}}{10}$, find $\sin 2\alpha$.

- A. $\frac{3\sqrt{10}}{5}$ B. $\frac{3}{5}$ C. $-\frac{4}{5}$ D. $-\frac{3}{4}$

19. _____

20 Which expression is equivalent to $\sin(90^\circ - \theta)$?

- A. $-\sin \theta$ B. $\tan \theta$ C. $\cos \theta$ D. $-\cos \theta$

20. _____

21.

Solve $2 \cos x - \sec x = 1$ for $0^\circ \leq x \leq 180^\circ$.

21. _____

22. Solve $5x^2 + 10x + 6 = 3$ by using the Quadratic Formula.

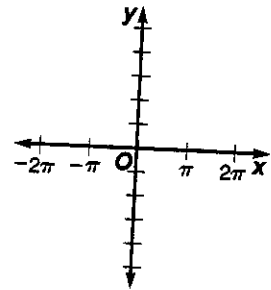
22. _____

23. Describe the transformation that relates the graph of $y = \sin\left(x - \frac{\pi}{2}\right)$ to the parent graph $y = \sin x$.

23. _____

24. Graph $y = \tan\left(\frac{\theta}{2} + \frac{\pi}{4}\right) - 1$.

24



25. Given a central angle of 56° , find the length of its intercepted arc in a circle of radius 6 centimeters. Round your answer to the nearest thousandth.

25. _____

26. Determine the rational zeros of $f(x) = 2x^3 - 3x^2 - 18x - 8$.

26. _____

27. State the amplitude and period for $y = -4 \cos x$.

27. _____

28. Write an equation of a cosine function with amplitude 5 and period 6.

28. _____

29. If $\sin \alpha = \frac{1}{3}$ and $\cos \beta = \frac{3}{4}$, find $\cos(\alpha - \beta)$ if α is a first quadrant angle and β is a fourth quadrant angle.

29. _____

30 Approximate the positive real zeros of the function $f(x) = x^3 + 3x - 8$ to the nearest tenth. 30 _____

31 Use the Law of Cosines to solve $\triangle ABC$ if $a = 10$, $b = 40$, and $C = 120^\circ$. Round answers to the nearest tenth. 31 _____

32 Solve $6^{2x+3} = 34.7$. Round your answer to the nearest hundredth. 32 _____
A. 2.49 B. -1.37 C. -0.51 D. -1.25

33 Solve $\log_6 5(2y - 3) = \log_6 25$. 33 _____
A. 2 B. 4 C. $\frac{7 + 3\sqrt{5}}{2}$ D. 1

34 Solve $3^{x+1} = 17$. Round your answer to the nearest hundredth. 34 _____
A. 5.23 B. 1.58 C. 3.00 D. 3.38

35 Find the twenty-first term in the arithmetic sequence 8, 3, -2, -7, 35 _____
A. -97 B. -95 C. -105 D. -92