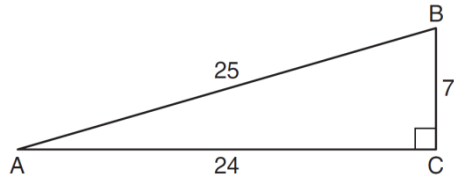
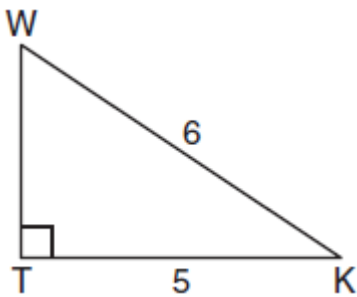


1. Which ratio represents  $\csc A$  in the diagram below?



- a)  $25/24$     b)  $25/7$     c)  $24/7$     d)  $7/24$     e) Not Given

2. In the diagram below of right triangle  $KTW$ ,  $KW = 6$ ,  $KT = 5$ , and  $m\angle KTW = 90^\circ$ .



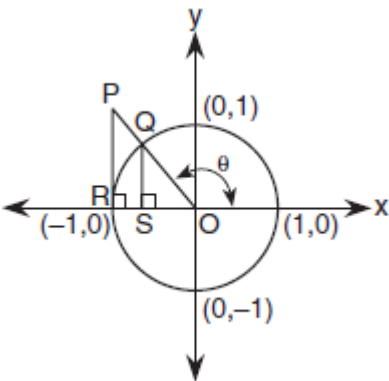
What is the measure of  $\angle K$ , to the nearest minute?

- a)  $33^\circ 33'$     b)  $33^\circ 34'$     c)  $33^\circ 35'$     d)  $33^\circ 36'$     e) Not Given

3. What is the radian measure of the smaller angle formed by the hands of a clock at 7 o'clock?

- a)  $\frac{\pi}{2}$     b)  $\frac{2\pi}{3}$     c)  $\frac{5\pi}{6}$     d)  $\frac{7\pi}{6}$     e) Not Given

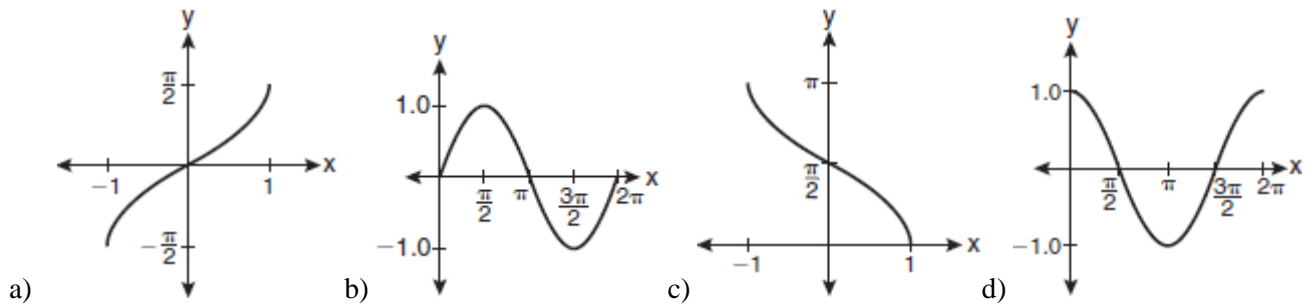
4. In the accompanying diagram,  $\overline{PR}$  is tangent to circle  $O$  at  $R$ ,  $\overline{QS} \perp \overline{OR}$ , and  $\overline{PR} \perp \overline{OR}$ .



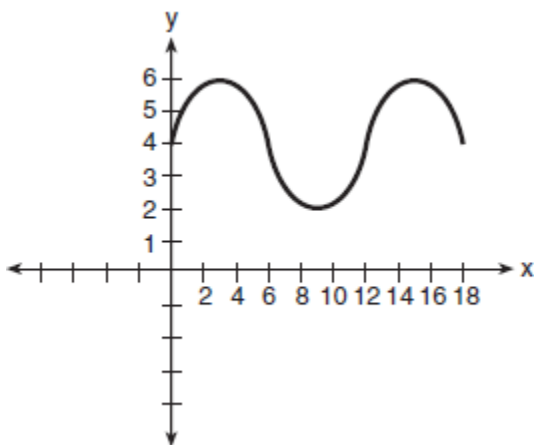
Which measure represents  $\sin \theta$ ?

- a) SO    b) RO    c) PR    d) QS    e) Not Given

5. If  $\cos \theta > 0$  and  $\csc \theta < 0$ , in which quadrant does the terminal side of  $\theta$  lie?
- a) I      b) II      c) III      d) IV      e) Can not be determined
6. If  $\sin \theta = \cos \theta$ , in which quadrants may angle  $\theta$  terminate?
- a) I      b) II      c) III      d) IV      e) Can not be determined
7. If  $(\sec x - 2)(2\sec x - 1) = 2$ , then  $x$  terminates in Quadrant(s)?
- a) I only      b) I and II only      c) I and IV only      d) I, II, III, and IV      e) Not Given
8. The rotation  $-2000^\circ$  terminates in what Quadrant?
- a) I      b) II      c) III      d) IV      e) Can not be determined
9. If  $\theta$  is an angle in standard position and the point  $(-3, -4)$  is on the terminal side of  $\theta$ , what is the  $\sec \theta$ ?
- a)  $3/5$       b)  $-3/5$       c)  $5/3$       d)  $-5/3$       e) Not given
10. Which graph represents  $y = \cos^{-1}(x)$ ?



11. What is the amplitude of the function in the following graph?



- a) 2      b) 3      c) 6      d) 9      e) Not Given

12. In a circle, a central angle of 3 radians intercepts an arc of 18 centimeters. What is the radius, in centimeters, of the circle?
- a)  $3/18$                       b) 3                      c) 6                      d) 11                      e) Not Given
13. If  $\sin(x - 3)^\circ = \cos(2x + 6)^\circ$ , then the value of x is
- a) 15 degrees              b) 26 degrees              c) 64 degrees              d) 90 degrees              e) Not Given
14. A building site is shaped like an isosceles triangle with  $AB=AC$  and  $m\angle BAC = 53^\circ 10'$ . If the area of the lot is one acre (43,260 square feet), what is the length of side AB?
- a) 115 ft              b) 295 ft              c) 330 ft              d) 813 ft              e) Not Given
15. An architect commissions a contractor to produce a triangular window. The architect describes the window as  $\triangle ABC$  where  $m\angle A = 50^\circ$ ,  $BC = 10$  inches and  $AB = 12$  inches. How many distinct triangles can the contractor construct using these dimensions?
- a) 3                      b) 2                      c) 1                      d) 0                      e) Not Given
16. While sailing a boat offshore, Donna sees a lighthouse and calculates that the angle of elevation to the top of the lighthouse is 3 degrees. When she sales her boat 700 feet closer to the lighthouse, she finds that the angle of elevation is now 5 degrees. How tall, to the nearest tenth of a foot, is the lighthouse?
- a) 72.4 ft              b) 80.4 ft              c) 91.5 ft              d) 103.2 ft              e) Not Given
17. If in  $\triangle ABC$ ,  $a = 5$ ,  $b = 6$ ,  $c = 8$ , then  $\cos A$  is
- a)  $-1/20$               b)  $11/32$               c)  $25/32$               d)  $53/80$               e) Not Given
18. In a parallelogram ABCD,  $AB = 14$ ,  $BC = 20$ , and  $m\angle B = 54^\circ$ . Find to the nearest tenth, the length of BD.
- a) 21.9              b) 33.1              c) 27.6              d) 19.6              e) Not Given
19. Which value is not in the domain of  $y = \tan x$ ?
- a) 0                      b)  $\frac{\pi}{2}$                       c)  $\pi$                       d)  $\frac{3\pi}{2}$                       e) Not Given

20. The vertex angle of an isosceles triangle measures 30 degrees and each leg measures 4, the area of the triangle is

- a)  $8\sqrt{3}$       b) 8      c)  $4\sqrt{3}$       d) 4      e) Not Given

21. A triangular plot of land has sides that measure 5 meters, 7 meters, and 10 meters, What is the area of the plot to the nearest tenth of a square meter?

- a) 11.9      b) 16.2      c) 17.1      d) 22.2      e) Not Given

22. The expression  $\frac{1 - \cos^2 x}{\sin^2 x}$  is equivalent to

- a) 1      b) -1      c)  $\sin x$       d)  $\cos x$       e) Not Given

23. The expression  $\cos^2 x - \cos 2x$  is equivalent to

- a)  $\sin^2 x$       b)  $\sin 2x$       c)  $\cos^2 x$       d)  $\cos 2x$       e) Not Given

24. The path traveled by a roller coaster is modeled by the function  $y = 27\sin(13x) + 30$ . What is the maximum altitude of the roller coaster?

- a) 13      b) 27      c) 30      d) 57      e) Not Given

25. The expression  $\cos 4x \cos 3x + \sin 4x \sin 3x$  is equivalent to

- a)  $\sin x$       b)  $\sin 7x$       c)  $\cos x$       d)  $\cos 7x$       e) Not Given