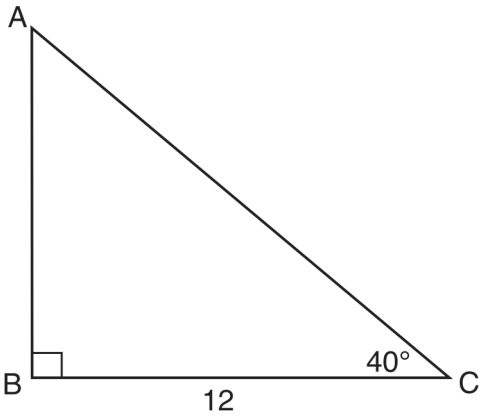
NY Regents Trigonometry Samples

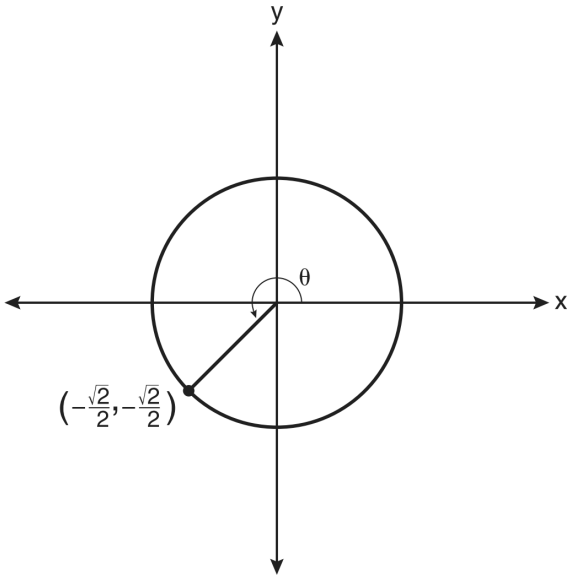
1. In the accompanying diagram of right triangle ABC, $BC = 12$ and $m\angle C = 40$.



Which single function could be used to find AB?

a) $\tan 50$ b) $\sin 50$ c) $\cos 40$ d) $\sin 40$

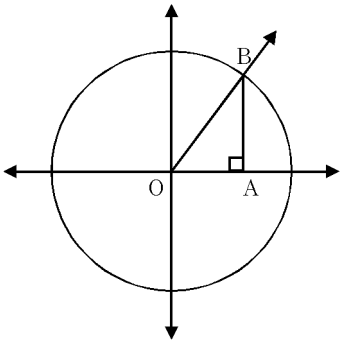
2. In the diagram below of a unit circle, the ordered pair $(-\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2})$ represents the point where the terminal side of θ intersects the unit circle.



What is $m\angle\theta$?

a) 45 b) 135 c) 225 d) 240

3. Circle O has its center at the origin, $OB = 1$, and $\overline{BA} \perp \overline{OA}$. If $m\angle BOA = \theta$, which line segment shown has a length equal to $\cos\theta$?



4. In a circle with a radius of 4 centimeters, what is the number of radians in a central angle that intercepts an arc of 24 centimeters?

5. Express $\frac{2\pi}{3}$ radians in degrees.

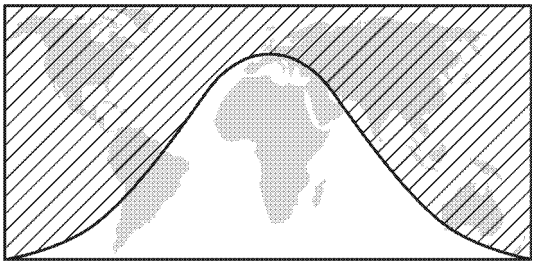
6. Express 240° in radian measure.

7. If $\sin\theta = 0.3347$, find the measure of positive acute angle θ to the *nearest minute*.

8. What is the value of $\cos(-240^\circ)$?

a) $\frac{\sqrt{3}}{2}$ b) $-\frac{\sqrt{3}}{2}$ c) $\frac{1}{2}$ d) $-\frac{1}{2}$

9. The shaded portion of the accompanying map indicates areas of night, and the unshaded portion indicates areas of daylight at a particular moment in time.

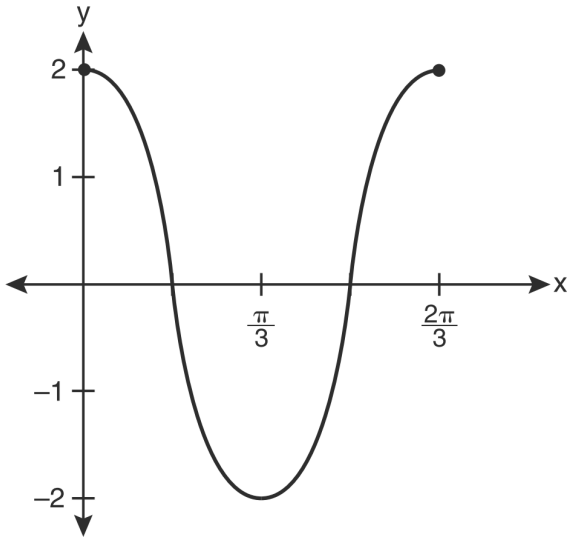


Which type of function best represents the curve that divides the area of night from the area of daylight?

a) quadratic b) cosine

c) tangent d) logarithmic

10. Which equation is represented by the graph below?



a) $y = 2\cos 3x$ b) $y = 2\sin 3x$

c) $y = 2\cos \frac{2\pi}{3}x$ d) $y = 2\sin \frac{2\pi}{3}x$

11. In $\triangle PQR$, p equals

a) $\frac{r\sin P}{\sin Q}$ b) $\frac{r\sin P}{\sin R}$ c) $\frac{r\sin R}{\sin P}$ d) $\frac{q\sin R}{\sin Q}$

12. If $\tan A < 0$ and $\cos A > 0$, in which quadrant does $\angle A$ terminate?

a) I b) II c) III d) IV

13. If $\tan x = -\sqrt{3}$, in which quadrants could angle x terminate?

a) I and II b) II and III

c) II and IV d) III and IV

14. If $\sin\theta = -\frac{8}{17}$ and $\tan\theta$ is positive, what is the value of $\cos\theta$?

15. The value of $\cos 16^\circ \cos 164^\circ - \sin 16^\circ \sin 164^\circ$ is

a) -1 b) $-\frac{1}{2}$ c) 0 d) $\frac{\sqrt{3}}{2}$

16. The expression $\cos(\pi - x)$ is equivalent to

a) $\sin x$ b) $-\sin x$ c) $\cos x$ d) $-\cos x$

17. The expression $\frac{\sin^2 B}{\cos B} + \cos B$ is equivalent to

a) 1 b) $\frac{1}{\cos B}$ c) $\frac{1}{\sec B}$ d) $\sin^2 B$

18. The expression $\sin^2 x + \cos^2 x - b^2$ is equivalent to

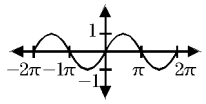
a) 1 b) b^2

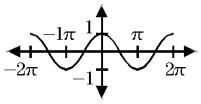
c) $(1 + b)(1 - b)$ d) $\sin x \cos x - b$

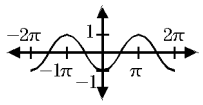
19. A wave displayed by an oscilloscope is represented by the equation $y = 3 \sin x$. What is the period of this function?

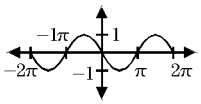
a) 2π b) 2 c) 3 d) 3π

20. Which graph represents the reflection of $y = \cos x$ in the y-axis?

a) 

b) 

c) 

d) 

21. If $\sin(x + 20^\circ) = \cos x$, the value of x is

a) 35° b) 45° c) 55° d) 70°

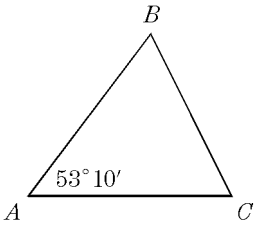
22. Find, to the *nearest ten minutes* or *nearest tenth of a degree*, all values of x in the interval $0^\circ \leq x < 360^\circ$ that satisfy the equation $4 \cos 2x - 2 \cos x + 3 = 0$.

23. What is the total number of distinct triangles that can be constructed if $AC = 13$, $BC = 8$, and $m\angle A = 36$?

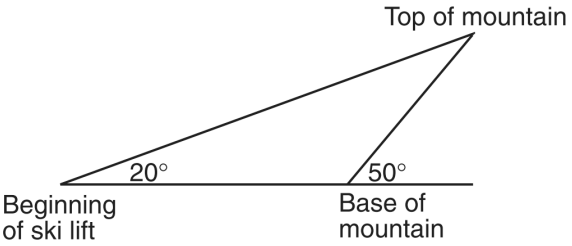
a) 1 b) 2 c) 3 d) 0

24. In $\triangle ABC$, $\cos C = -0.2$, $a = 8$, and $b = 10$. Find the length of side c.

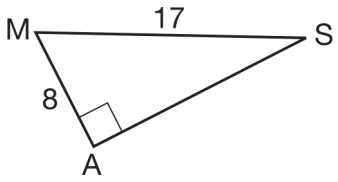
25. The building lot shown in the accompanying diagram is shaped like an isosceles triangle with $AB = AC$ and $m\angle BAC = 53^\circ 10'$. The area of the lot is one acre. Find the lengths of *each* of the three sides to the *nearest foot*. [One acre = $43{,}560\,\text{ft}^2$] [*Show or explain the procedure used to obtain your answer.*]



26. A ski lift begins at ground level 0.75 mile from the base of a mountain whose face has a 50° angle of elevation, as shown in the accompanying diagram. The ski lift ascends in a straight line at an angle of 20°. Find the length of the ski lift from the beginning of the ski lift to the top of the mountain, to the *nearest hundredth of a mile*.



27. In the right triangle shown below, what is the measure of angle S, to the *nearest minute*?



a) $28^\circ 1'$ b) $28^\circ 4'$ c) $61^\circ 56'$ d) $61^\circ 93'$