1. Convert $\frac{16\pi}{9}$ radians to degrees.

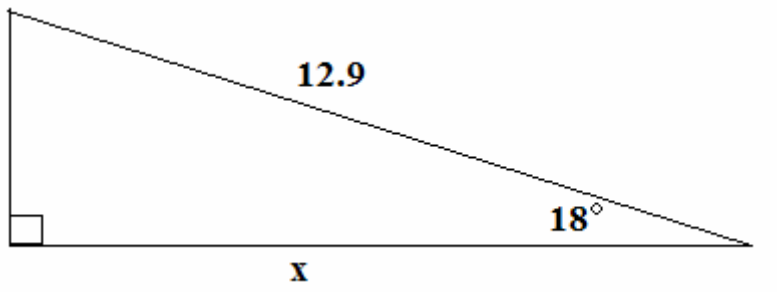
a) 160°

b) 510°

c) 430°

d) 320°

2. Find the value of *x* for the triangle shown at the right.



a) 8.5

b) 12.3

c) 13.6

d) 41.7

3. In triangle ABC, $C = 160°$, $a = 12.5$, and $c = 17$.
Find the measure of angle A.

a) $14.6°$

b) $27.7°$

c) $9.8°$

d) This triangle is impossible to form using the given information.

4. Reduce the following to a single function: $\csc x \cos x$

a) $\sin x$

b) $\cot x$

c) $\tan x$

d) $\sec x$

5. Given $\cos\theta = -\frac{8}{17}$ and $\tan\theta < 0$, find $\csc\theta$.

a) $\frac{17}{8}$

b) $-\frac{15}{17}$

c) $-\frac{17}{8}$

d) $\frac{17}{15}$

6. A satellite is directly between two monitoring stations. The angle of elevation from one of the stations is $67.8°$ and from the other station is $82.7°$. If the satellite is located 750 miles above the earth, about how far apart are the two monitoring stations?

a) 102 miles

b) 302 miles

c) 402 miles

d) 502 miles

7. Determine the exact value of $\tan(\cos^{-1} b)$.

a) $\dfrac{b}{\sqrt{1-b^2}}$

b) $\dfrac{\sqrt{1-b^2}}{b}$

c) $\dfrac{b}{\sqrt{1+b^2}}$

d) $\dfrac{\sqrt{1+b^2}}{b}$

8. Determine the period of the function: $y = 8\sin(0.5x)$

a) $\frac{\pi}{2}$

b) π

c) 2π

d) 4π

9. For what two values of x between $0°$ and $360°$ is $\tan x = -0.2345$?

a) $13.2°$ and $193.2°$

b) $166.8°$ and $346.8°$

c) $76.8°$ and $256.8°$

d) $124.8°$ and $304.8°$

10. What is the complete solution set to the equation $\sin x - \sin^2 x = 0$ on the interval $[0, 2\pi)$?

a) $x = 0,\ \pi,\ \frac{3\pi}{2}$

b) $x = 0,\ \pi$

c) $x = 0,\ \frac{\pi}{2},\ \pi$

d) $x = \ \pi,\ \frac{\pi}{2}$

11. What is the coordinate on the unit circle associated with the angle $\frac{7\pi}{2}$?

a) $(1,0)$

b) $(0,1)$

c) $(-1,0)$

d) $(0,-1)$

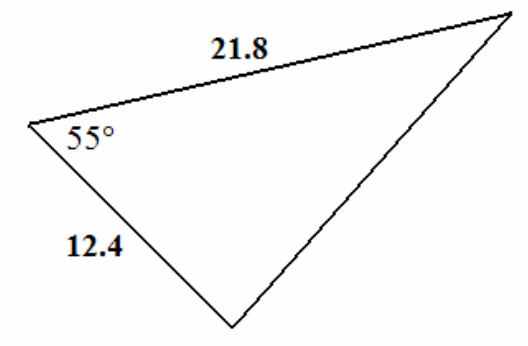
12. Use the law of cosines to determine the length of the missing side

a) 28.6

b) 24.8

c) 17.9

d) 14.6



13. A circular machine part makes 126 revolutions per minute. If the machine part has a radius of 4 centimeters, how fast is a point on the edge of the circle moving (in centimeters per second)?

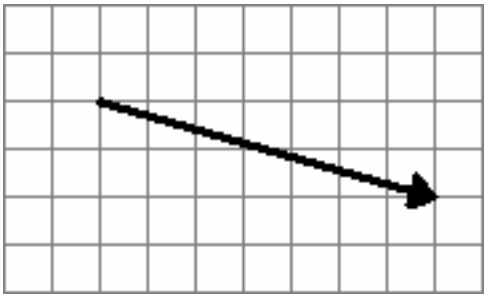
a) 31.7 cm/sec

b) 52.8 cm/sec

c) 43.5 cm/sec

d) 68.1 cm/sec

14. Put the vector shown here in component form.



a) $7\mathbf{i} - 2\mathbf{j}$

b) $-2\mathbf{i} + 7\mathbf{j}$

c) $2\mathbf{i} + 7\mathbf{j}$

d) $-7\mathbf{i} - 2\mathbf{j}$

15. Two forces are acting on the same point. One of the two forces is moving along the x-axis with a magnitude of 26 lbs and the other force is moving at a $61°$ angle into the first quadrant with a magnitude of 35 lbs. What is the magnitude of the resultant of these two forces?

a) 67.2 lbs

b) 94.6 lbs

c) 52.8 lbs

d) 43.7 lbs