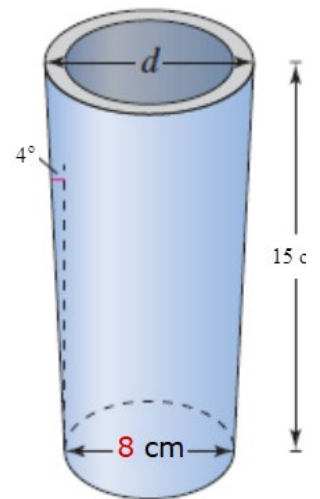


Be sure to follow [College Algebra formatting guidelines](#) in your work. They're the same for us as they are for College Algebra, except we're "1420" and not "1340," so "1420" in the top left corner, not "1340."

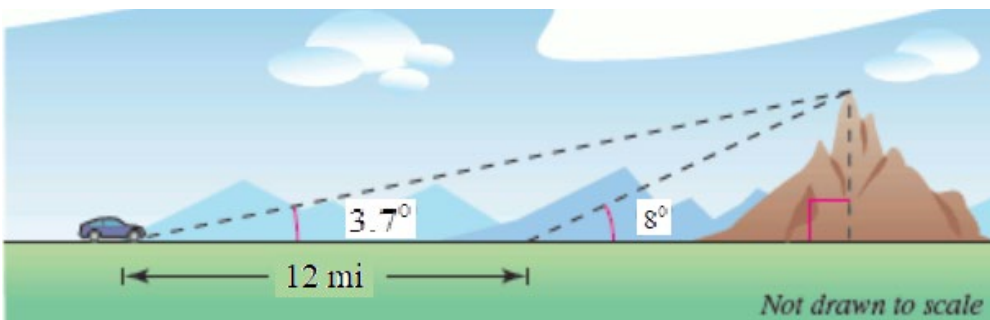
- (5 pts) Evaluate $\sin\left(\frac{-11\pi}{3}\right)$ using its period as an aid.
- (5 pts) Find the point on the unit circle corresponding to $t = \frac{7\pi}{6}$.
- (5 pts) Use a calculator to find the value of $\cot(2.5)$ to 4 decimal places. Sketch this angle.
- If possible, find the value of the 6 trigonometric functions at the real number t . Then sketch the angle:
 - (5 pts) $t = \frac{5\pi}{3}$.
 - (5 pts) $t = -\frac{5\pi}{6}$
 - (5 pts) $t = \frac{3\pi}{2}$
- (5 pts) Find the *exact* value of the 6 trigonometric functions corresponding to the point $\left(\frac{5}{13}, \frac{12}{13}\right)$ on the unit circle. Sketch this point.

6. (5 pts) If f is odd, then $f(-t) =$ and if f is even, then $f(-t) =$.

7. (5 pts) A tapered shaft has a bottom diameter of 8 cm at the small end, a height of 15 cm and a taper of 4° . Find the diameter of the top of the shaft. See figure on the right.



8. (5 pts) In traveling across flat land, you see a mountain directly in front of you. Its angle of elevation (to the peak) is 3.7° . After you drive 12 miles closer to the mountain, the angle of elevation is 8° . Approximate the height of the mountain above the plain. Give your answer in feet, to the nearest foot. See figure, below:

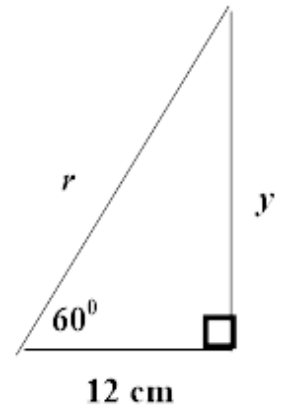


9. (5 pts) Find the exact value of y and r from the figure on the right.

10. Find the *exact* values of θ in degrees ($0^\circ < \theta < 90^\circ$) and radians ($0 < \theta < \frac{\pi}{2}$), without using a calculator, given that... Also draw the triangles corresponding to each, as demonstrated in class.

a. (5 pts) ... $\cos(\theta) = \frac{\sqrt{3}}{2}$

b. (5 pts) ... $\tan(\theta) = 1$



11. (5 pts) Use trig identities to transform the left side of the equation into the right side. Assume ($0 < \theta < \frac{\pi}{2}$):

$$\tan(\theta) + \cot(\theta) = \csc(\theta)\sec(\theta)$$

12. (5 pts) Find the *exact* values of the six trigonometric functions of the angle θ shown in the figure on the right.

13. (5 pts) Sketch a right triangle corresponding to $\sin(\theta) = \frac{3}{13}$, where θ is an acute angle. Then find the exact values of the other five trigonometric functions of θ .

14. (5 pts) Use a calculator to evaluate $\sin(31^\circ 23' 31'')$. Round your answer to 4 decimal places.

