1. a). What is the relationship between degrees and radians?

   b). What is the conversion factor from degrees to radians?

   c). What is the conversion factor from radians to degrees?

2. a). What is the formula for arc length of a circle?

   b). What is the formula for the area of a sector of a circle?

   c). What do the variables in these formulas represent?

3. a). What is the formula that relates linear speed to angular speed?

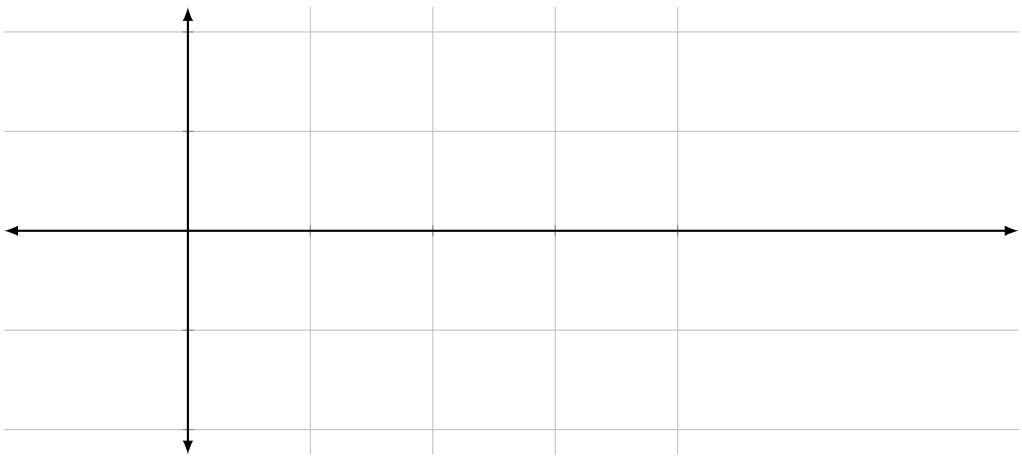
   b). How many miles per foot?

   c). How many seconds per hour?

   d). Convert 100 feet per second to miles per hour.

4. a). Describe the effect of the constants a, b, c and d in $a \cdot \cos(bx + c) + d$.

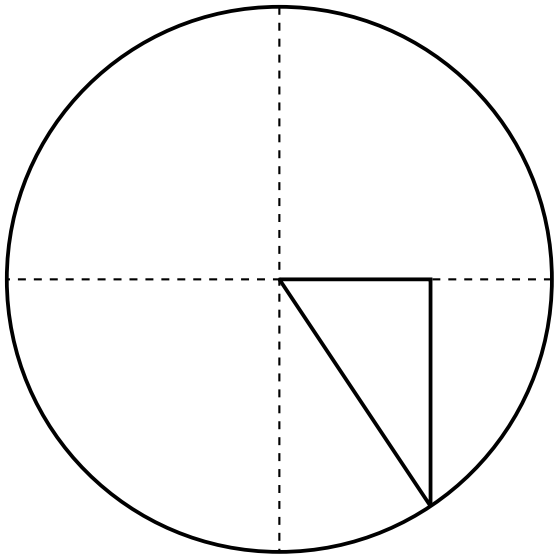
   b). Choose appropriate labels for the axes (e.g. $0, \pi/4, \pi/2, 3\pi, 4$) and graph $-\cos\left(\frac{3\pi}{4}x + \frac{\pi}{2}\right) + 1$.



5. a). Name the three sides of a right triangle in the unit circle with respect to interior angle θ.

   b). In terms of the sides, what are the ratios of the six trigonometric functions?

   c). If the circle below passes through the point $(4, -6)$, label every known point, side length and angle.



   d). Calculate the six trigonometric functions associated with the point $(4, -6)$.

6. a). "Compute" $\cos(\arccos(1))$, $\arccos(\cos(1))$, $\arcsin(\sin(1))$, $\sin(\arcsin(1))$, $\tan(\arctan(1))$ and $\text{arccot}(\cot(1))$.

   b). Why can't you "compute" $\text{arcsec}(0)$ or $\arcsin(42)$?

7. a). List the three forms of the Pythagorean identity.

   b). Show that they are all the same equality.

8. a). Use the Pythagorean identity to rewrite $\cot^2(\theta) = csc(\theta) + 1$ in terms of a single trig function.

   b). Substitute a variable for your trig function (e.g. $x = \sin(\theta)$) and solve the quadratic.

   c). Substitute the trig function back into your solutions (e.g. $x = \frac{1}{2} \iff \sin(\theta) = \frac{1}{2}$), and solve for θ.