2.1. Basic Geometry

1. Find all points of intersection between each of the following lines and the unit circle.
   a) $y = 2x - 1$
   b) $2y = x + 1$
   c) $y = x - 3$
2. The size of a computer is the diagonal measurement across the screen. The new 13” macbook pro \(^1\) has a 13.3 in display. The width and depth of this model is 11.97 in and 8.36 in, respectively.

a) Using the pythagorean theorem, verify that there is a difference between the dimensions of the computer and the dimensions of the display. This is because of the bezel—the outside frame area around the monitor glass.

b) To make the problem simpler, let’s suppose instead that our computer is a square, with both width and depth equal to 10 in. Find the approximate width of the bezel.

\(^1\)Apple Specs
2.2. The Sine and Cosine Functions

1. Let \( \cos(\theta) = -0.5 \). Find \( \sin(\theta) \), assuming that \( 0 < \theta < 180^\circ \).

2. Complete each of the triangles below.
3. (Practice Exercise 2.2.C) Simon shoots a bottle rocket such that its flight path makes an angle of 80 with the ground. It flies 600 ft in a straight line before it erupts. How far off of the ground is it when it erupts? Round to two decimal places.

4. According to The Health and Safety Authority, the safest angle to prop up a ladder is 75°.

   a) Say that I want to wash the windows on the second story of my house, which I estimate to be about 20 feet from the ground. How long of a ladder do I need?

   b) Suppose that I went out and bought the ladder with the length we found in part (a), but when I get home I realize my windows are half a foot higher from the ground than I expected. How much closer to the house do I need to scooch my ladder to reach my windows?