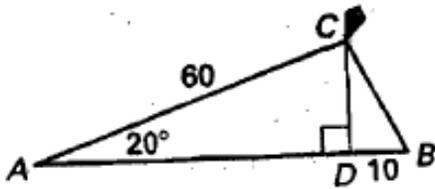


1. In a right triangle,  $\theta$  is an acute angle and  $\tan \theta = \frac{2nv}{n^2 - v^2}$ . Find  $\sin \theta$  in terms of  $n$  and  $v$ .

(hint: draw triangle and label sides)

2. In the diagram below, a kite at point  $C$  is being held by a string from point  $A$  that is 60 ft long. The angle of elevation of the kite from point  $A$  is  $20^\circ$ . An observer at point  $B$  is 10 ft from the point on the ground  $D$  directly below the kite. To the nearest tenth of a degree, what is the angle of elevation of the kite from point  $B$ ? DO NOT USE YOUR CALCULATOR UNTIL YOU ARE READY TO CALCULATE ANGLE  $B$ .



3. An observer on the ground measures the angle to the top of a flagpole to be  $22^\circ$ . The observer walks 20 ft closer to the flagpole and measures the angle of elevation to the top of the flagpole to be  $33^\circ$ .
- Draw a diagram. Let  $x$  = the distance from the closer position to the base of the flagpole and  $y$  = the height of the flagpole. Write a system of two equations involving  $x$  and  $y$ .
  - Solve the system from part (a) to find the height of the flagpole to the nearest tenth of a foot.

4. Find  $x$  in the diagram below, using the following method.
- Using the Law of Cosines, write two equations involving  $x$  and  $\theta$ .
  - Simplify the equations and solve the system of equations to find  $\theta$ . Then use this value to find  $x$ .

