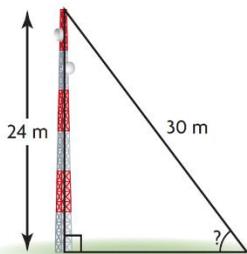# Applications of Trigonometry

1. A guy wire is attached to a cellphone tower as shown below. The guy wire is 30 m long, and the cellphone tower is 24 m high. Determine the angle that is formed by the guy wire and the ground.

2. A tree that is 9.5 m tall casts a shadow that is 3.8 m long. What is the angle of elevation of the sun?

3. The rise of a rafter drops by 3 units vertically for every 5 units of run horizontally. Determine the angle of depression of the rafter.

4. Safety by-laws state that for a ladder to be stable, the angle the base of the ladder makes with the ground should be between 70° and 80°. A safety inspector at a construction site notices a painter on a 10-m ladder that is leaning against a wall. The base of the ladder is 1.5 m away from the wall. Does the inspector have cause to be concerned? Explain.

5. A helicopter sights a boat in distress at an angle of depression of 40°. The helicopter is hovering 400 m above the water. What is the horizontal distance between the helicopter and the boat?

6. Isabelle is flying a kite on a windy day. When the kite is 15 m above the ground, it makes an angle of 50° with the horizontal. If Isabelle is holding the string 1 m above the ground, how much string has she released?

7. Elise drew a diagram of her triangular yard. She wants to cover her yard with sod. Explain how you could calculate the cost, if sod costs $1.50/m².