# Chapter 3 Unit 1 Project

Section 3.1

1. A satellite radio cell tower provides signals to three substations, T1, T2, and T3. The three substations are each located along a stretch of the main road. The cell tower is located 24 km down a road perpendicular to the main road. A surveyor calculates the angle from T1 to the cell tower to be 64°, from T2 to the cell tower to be 33°, and from T3 to the cell tower to be 26°. Calculate the distance of each substation from the intersection of the two roads. Express your answers to the nearest tenth of a kilometre.
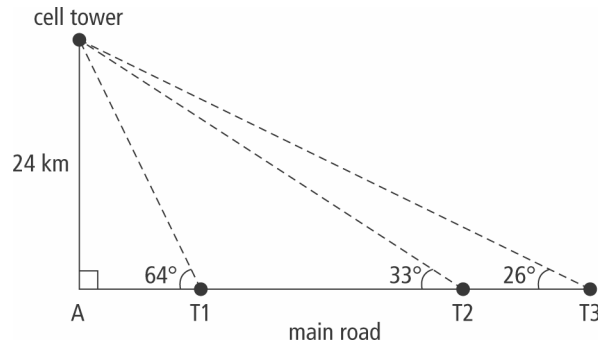

2. The first sound recordings were done on wax cylinders that were 5 cm in diameter and 10 cm long. Wax cylinders were capable of recording about 2 min of sound. Modern music storage devices can have tremendous memory and store thousands of songs. Janine calculated the number of wax cylinders needed to match a 32 GB storage capacity. Imagine that these cylinders are stacked one on top of another. From a distance of 10 m, the angle of elevation to the top of the stack would be 89.5^o.

a) Draw and label a diagram to represent the situation.

b) Determine the height of the stack of cylinders, to the nearest hundredth of a metre.

c) How many cylinders would need to be stacked to match 32 GB of storage?

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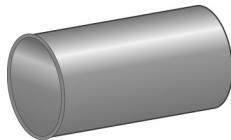
Section 3.3

3. A cell phone can be used to send music, but as your location changes, you move in and out of range from one *cell* to the next. Three or more cellular towers may pick up a cell phone's signal. A cell phone signal has been located 5 mi from tower 1.
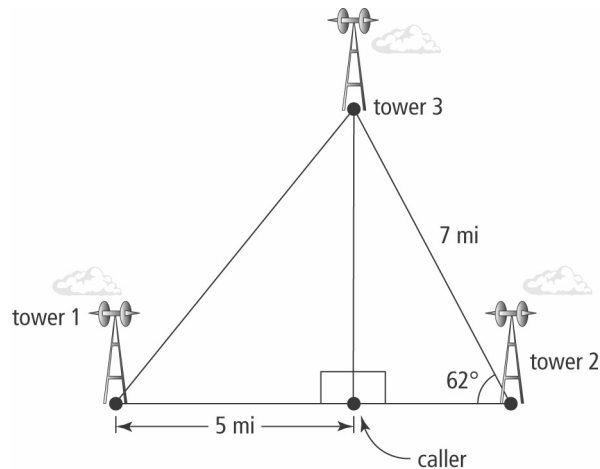
a) What is the distance from the caller to tower 3?

b) How far is tower 1 from tower 3?