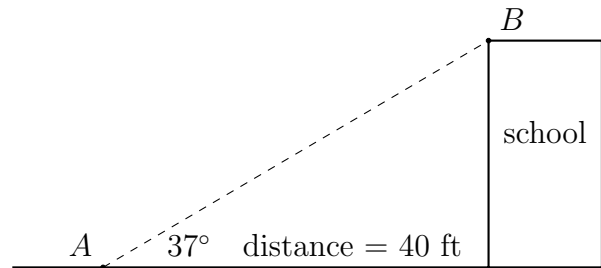## 12.6 Trigonometric situations   HSG.SRT.C.8

1. Shown is a building with student A on the ground waving up to student B. Point A is 40 feet from the base of the building, and the angle of elevation from A to B is $37°$.

   Find how high up student B is from the ground to the *nearest foot.*   (not to scale)

2. Yolanda is making a springboard to use for gymnastics. She has 8-inch-tall springs and wants to form a 16.5 angle with the base, as modeled in the diagram below.
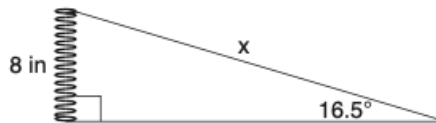

   To the *nearest tenth of an inch*, what will be the length of the springboard, x?

3. A child sleds from the top of a hill to a group of friends standing at the base of the hill. The hill is 20 feet tall, and the distance from the sledder to the group of friends is 110 feet. Find the angle of the incline x.
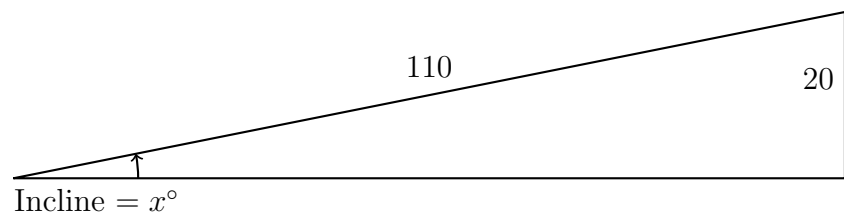

4. A pirate, who is two meters tall, is standing on a mast 8 meters tall. Looking down, the pirate sees an enemy ship 45 meters away.

   Find the angle of depression to the nearest degree.

   Angle of depression $= \theta°$

   $h = 8 + 2$ meters

   Enemy ship   45 meters
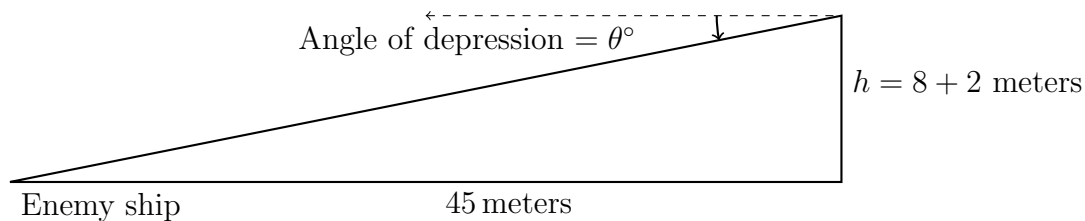
5. A snowman is standing 6 meters away from the base of a set of monkey bars, looking up at a boy x meters off the ground. The snowman is 1 meter tall and the angle of elevation of his view to the boy is 18.5°.

   Find the height of the boy off the ground.

   (not drawn to scale)

   Boy

   Monkey

   Bars

   18.5°
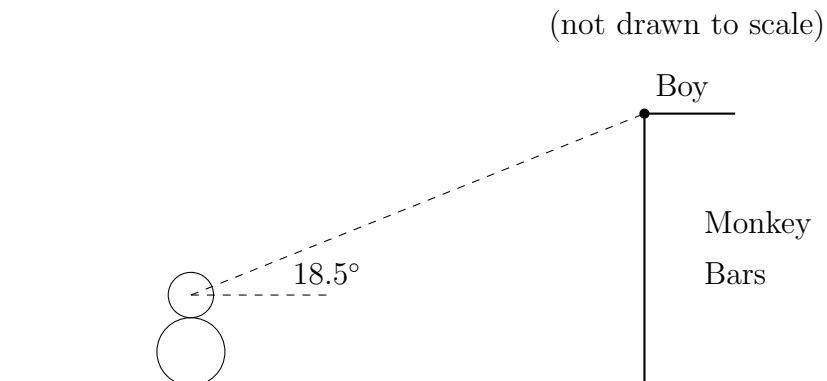
6. A drone flying at an altitude of 1,800 meters is observed twice. The first time the angle of elevation is 7.2° and exactly one minute later the angle of elevation is 9.7°.

   Find the distance the drone flies over the minute and its speed in kilometers per hour.

   (not drawn to scale)

   drone

   Angles of elevation

   9.7°

   1800

   7.2°
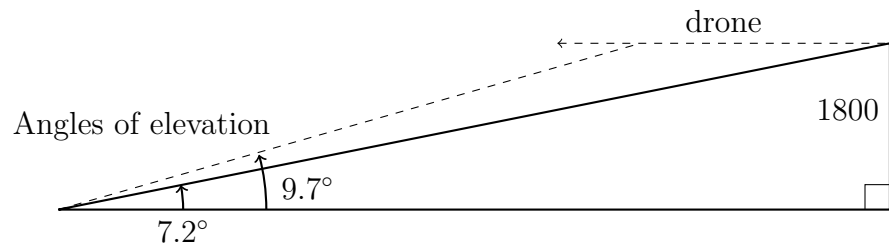
7. The vertices of quadrilateral $MATH$ have coordinates $M(-4, 2)$, $A(-1, -3)$, $T(9, 3)$, and $H(6, 8)$.

   Prove that quadrilateral $MATH$ is a parallelogram.