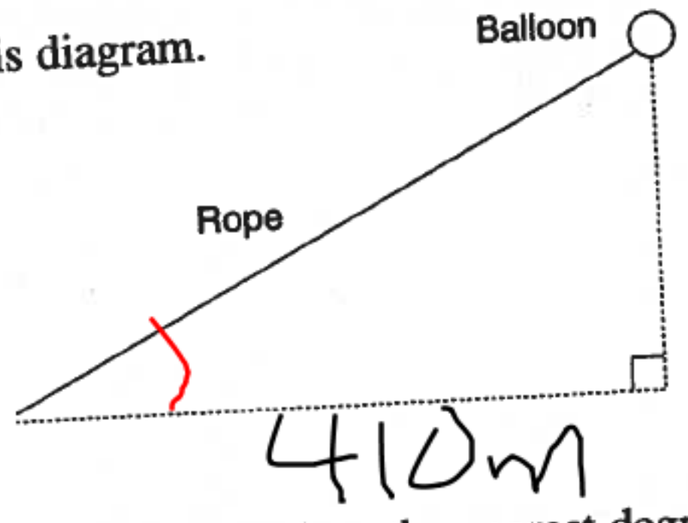
Name: MDL

Section 7.1

**2.** A helium balloon at one end of a long rope is blown by a strong wind to a position 280 m above a point on the ground 410 m from the other end of the rope.

**a)** Mark the known quantities on this diagram.




**b)** Find the angle between the rope and the ground, to the nearest degree.

Let $\angle Z$ represent the angle between the rope and the ground. Label this angle on the diagram.

$$\tan Z = \frac{280}{410} \quad \frac{O}{A}$$

$$\tan Z = 0.6829$$

$$\angle Z = \tan^{-1}(34.3)$$

$$\angle Z \doteq 34°$$

Therefore, the angle between the rope and the ground measures about 34°.

**c)** What assumption did you have to make about the rope to solve this problem?

**3.** A hawk, hovering directly over a small bush, spots a mouse at an angle of 12°

$\tan Z =$ _____

$\angle Z = \tan^{-1}($ _____ $)$

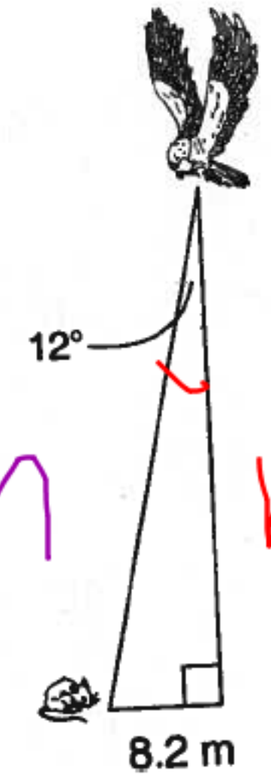
$\angle Z \doteq$ _____°

Therefore, the angle between the rope and the ground measures about _____°.

**c)** What assumption did you have to make about the rope to solve this problem?

**3.** A hawk, hovering directly over a small bush, spots a mouse at an angle of 12° from the vertical. If the mouse is 8.2 m from the bush, how high is the hawk?

Let $h$ represent the height of the hawk. Mark $h$ on the diagram, and label the opposite and adjacent side for the 12° angle.




Substitute into the formula for the tangent ratio: $\tan 12° =$ _____

Solve for $h$:

_____

Therefore, _____

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Section 7.2

**2.** When this 5.0-m long airplane is parked, its nose is 1.5 m from the ground. What angle does the body of the plane make with the ground, to the nearest degree?

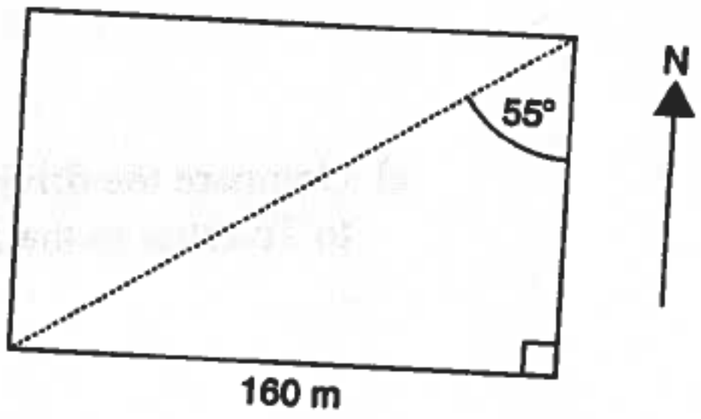

$\sin x = \frac{O}{H}$

$\sin x = \frac{1.5}{5}$

$\angle x = 17.4^\circ = 17^\circ$ ∴ the angle between the plane + the ground is $17^\circ$

**3.** A utility company needs to run a power cable from the southwest corner of this rectangular field to the northeast corner.

**a)** How long is the diagonal of the field, to the nearest metre?




**b)** Use the sine ratio to find the length of the east side of the field.