Name: _____   Date: _____

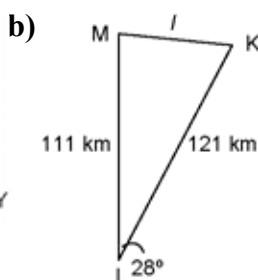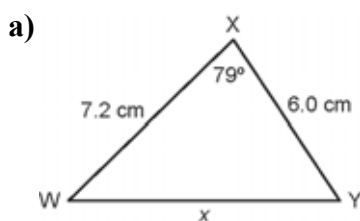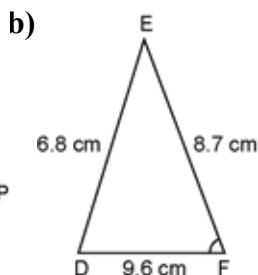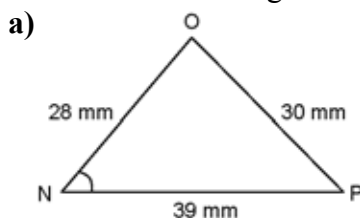# Section 4.5 Investigate the Cosine Law

1. Write each version of the cosine law for any ΔABC.
  a) The form used to determine the length of side c.
  b) The form used to determine the measure of ∠C.

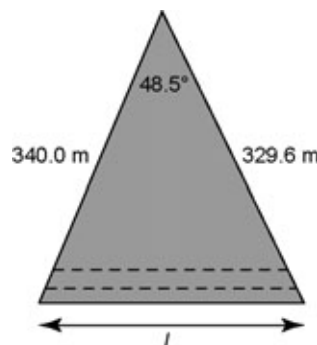**2.** Find the length of the unknown side, to the nearest tenth of a unit.
  a)

  b)

3. Find the measure of each marked angle, to the nearest tenth of a degree.
  a)

  b)

4. Sketch each triangle. Then, use the cosine law to solve the triangle. Round your answers to the nearest tenth of a unit.
  a) In ΔHJK, HJ = 8.9 mm, HK = 7.9 mm, and ∠H = 72°.
  b) In ΔPQR, PQ = 20.3 m, QR = 28.0 m, PR = 19.6 m.

5. The pendulum of a clock is 90.0 cm long. The total horizontal distance travelled in one swing is 7.9 cm. Determine the angle through which the pendulum swings, to the nearest tenth of a degree.

6. A surveyor took these measurements for a proposed tunnel through a small mountain. She used the top of the mountain as a reference point. Determine the length of the tunnel to the nearest metre.

7. Two runners start from the same point at the same time. They run at constant speeds in different directions. Runner A runs due north at 5 km/h and runner B runs 60° east of north at 8 km/h. Determine the distance between the runners after 2 h.

8. A farmer plans to build a triangular fence with side lengths of 500 m, 461 m, and 408 m. Determine the measures of the angles between the adjacent sides of the fence, to the nearest degree.

9. One tent pole is supported by two guy ropes. The ropes attach to the tent pole at a height of 125 cm. The first rope forms an angle of 52.8° with the ground and is due west of the tent. The second rope forms an angle of 41.8° with the ground and is 9° west of south of the tent. How far apart are the two pegs, to the nearest centimetre?