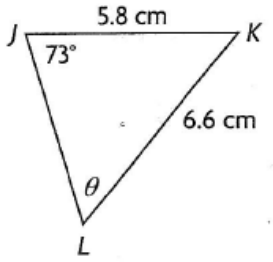
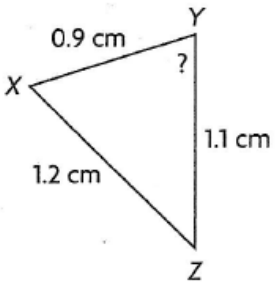
Worksheet – Sine & Cosine Laws

1. Can you determine the indicated angle measure? If so, would you use the sine law or the cosine law? Explain how you know.

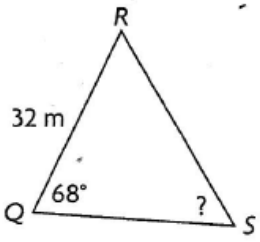
a)



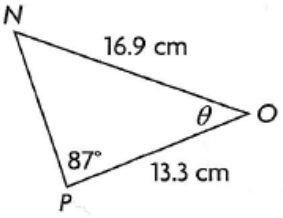
b)



c)



d)



2. Determine the indicated angle measures in question 1, where possible.

3. Read each situation description. Can you determine the indicated distance or angle measure? If so, would you use the sine law or the cosine law?

a) An engineer measures the angle of elevation to the top of a building as 65°. She then walks 25.0 m to the other side of the building, turns around, and measures the angle of elevation to the same point on the building to be 75°. She wants to determine the distance from her second location to the top of the building.

b) A surveyor places three stakes that make a triangle with angles of 50°, 60°, and 70°. He wants to determine the perimeter of the triangle.

c) A kayak leaves a dock on Lake Athabasca and heads due north for 2.3 km. At the same time, a second kayak travels in a direction N55°E from the dock for 1.8 km. In which direction, to the nearest degree, would the second kayak have to travel to meet the first kayak?

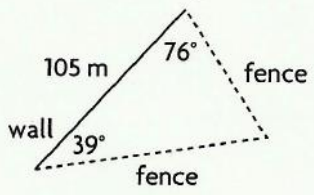
4. Determine the indicated value in each part of question 3, where possible.

TIP

Drawing a clearly labelled diagram makes it easier to select a strategy for solving a problem.

5. Look at the fences enclosing the pen shown.

a) How long is the lower fence? **b)** How long is the upper right fence?



6. A hiker leaves base camp in Banff National Park and travels N20°W for 0.7 km. The hiker then travels S65°W until he is directly west of the camp. How far is the hiker from the camp, to the nearest tenth of a kilometre?

ANSWERS:

1. **a)** yes; sine law **b)** yes; cosine law **c)** no **d)** yes; sine law
2. **a)** $\angle L \doteq 57°$ **b)** $\angle Y \doteq 73°$ **d)** $\angle O = 41°$
3. **a)** yes; sine law **b)** no **c)** yes; e.g., sine law and cosine law
4. **a)** $\doteq 35.2$ m **c)** $\doteq$ N49°W
5. **a)** $\doteq 112.4$ m **b)** $\doteq 72.9$ m
6. $\doteq 1.7$ km