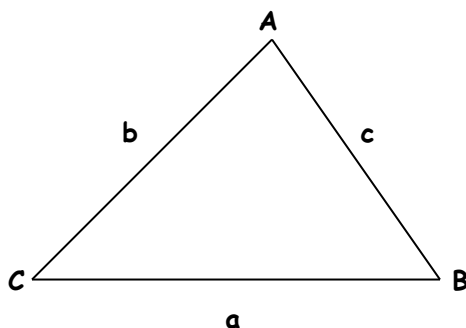


### 5.3 INVESTIGATE THE SINE LAW

For a triangle labeled as shown, the SINE LAW can be written as:

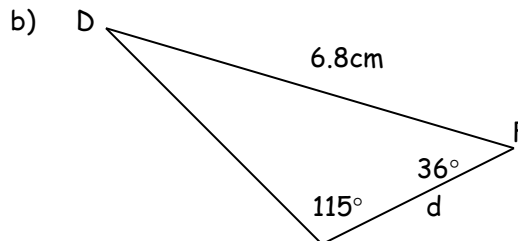
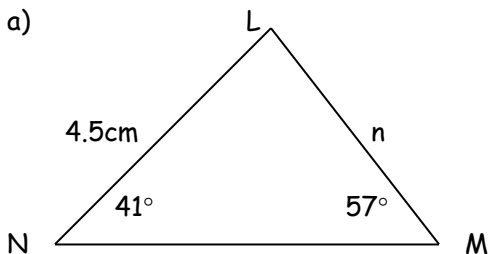
$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c} \quad \text{or} \quad \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$



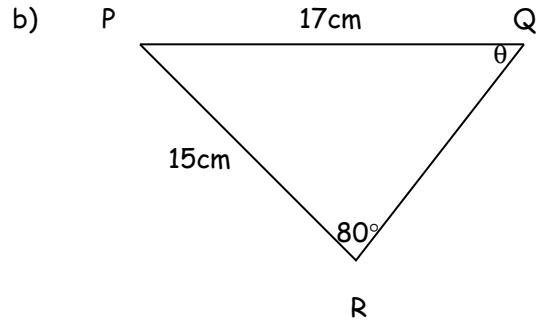
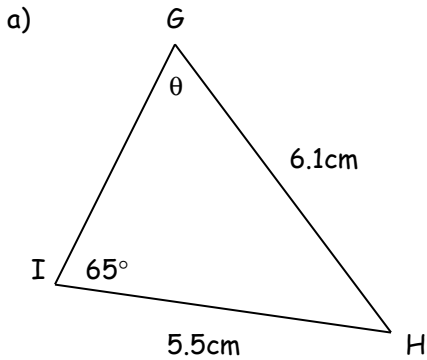
- To use the sine law to solve a triangle, you must know either:
  - | Two sides and one non-contained angle, or
  - | Two angles and any side.
- Once you have set up the sine law with the given information, you solve the unknown side length or angle measure by cross multiplying the equivalent fractions and then isolating the missing quantity.
- Recall : When finding a missing angle measure, you must use the  $\sin^{-1}$  function on your calculator.
- To **solve** a triangle means to find all missing side lengths and angle measures.

Examples :

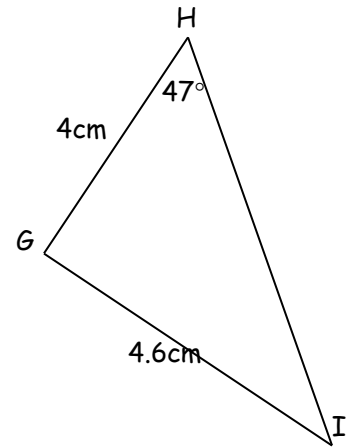
1. Find the length of the indicated side, to one decimal place.



2. Find the measure of the indicated angle measures, to the nearest degree.



3. Solve the following triangle. Round all side lengths to one decimal place and all angle measures to the nearest degree.



4. A radio tower is supported by two wires on opposite sides. The wires form an angle of  $60^\circ$  at the top of the post. On the ground, the ends of the wire are 15.0m apart, and one wire is at a  $45^\circ$  angle to the ground.

a) How long will the wires be, to the nearest tenth of a meter?

b) How tall is the radio tower, to the nearest tenth of a meter?