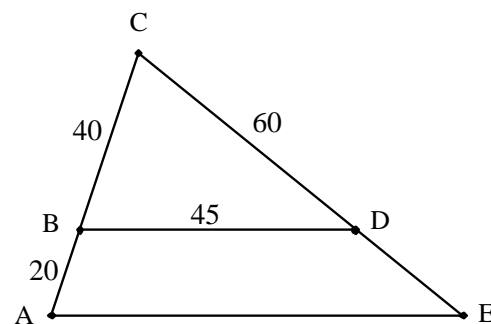
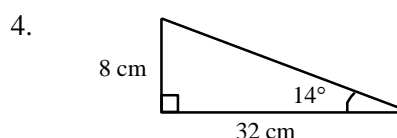
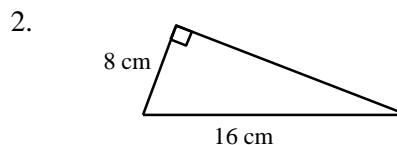
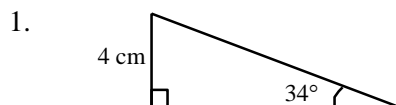


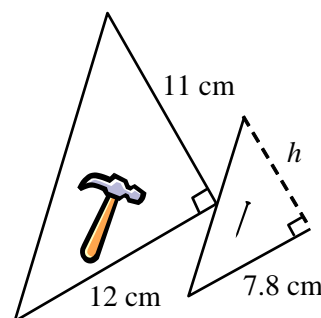
- 1 Five towns (A, B, C, D and E) on a map are connected by roads as illustrated in the diagram. The distance between these towns is calculated in km. Road BD is parallel to road AE. **What is the distance between town A and town E?**



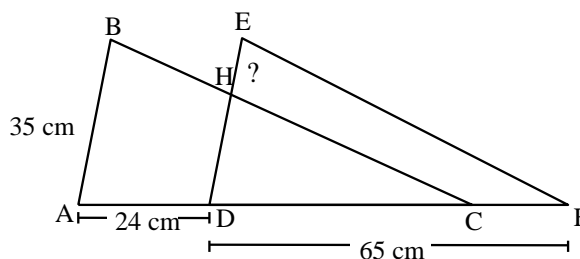
- 2 Two of the right triangles shown below are similar. **Which two triangles are similar?**



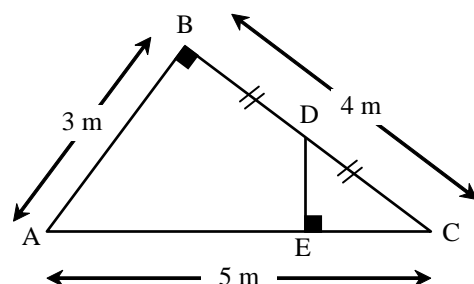
- 3 A construction company uses two similar triangles to create its logo, as shown below right. The height of the large triangle is 11 cm and the base is 12 cm. The base of the small triangle is 7.8 cm. **What is the height (h) of the small triangle?**



- 4 In the figure on the right, triangles ABC and DEF are congruent. Triangle ABC and DHC are similar. **What is the measure of \overline{EH} ?**



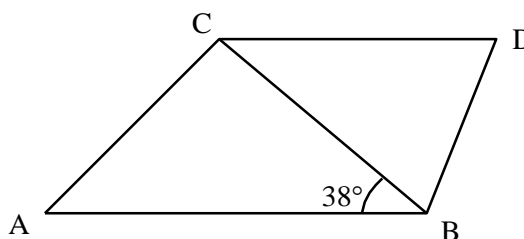
- 5 The diagram on the right represents the cross section of the roof of a shed. Support beam \overline{DE} is added, point D being the midpoint of \overline{BC} . Triangles CDE and CAB are similar. **What is the length of the support beam \overline{DE} ?**



- 6 In the figure below,
 $\overline{AB} \parallel \overline{CD}$
 \overline{BC} is a transversal
 $m \overline{BC} = m \overline{CD}$
 $m \angle ABC = 38^\circ$

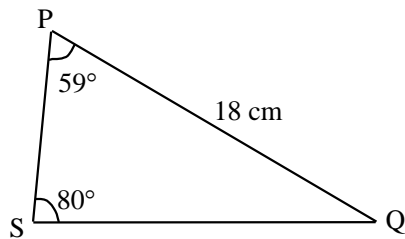
Show that the measure of angle BDC is 71° .

Justify each step of your work.

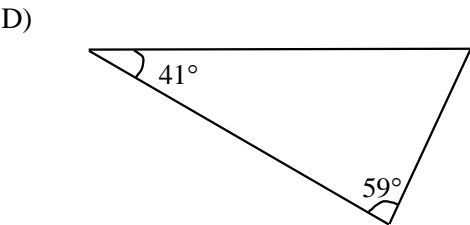
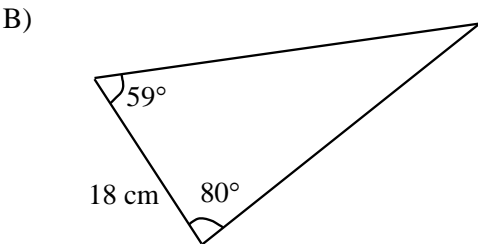
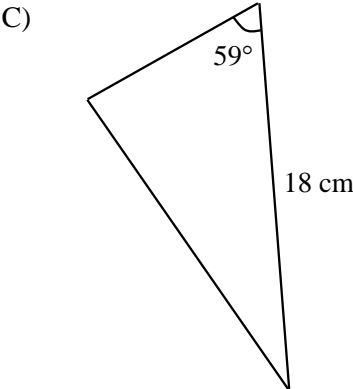
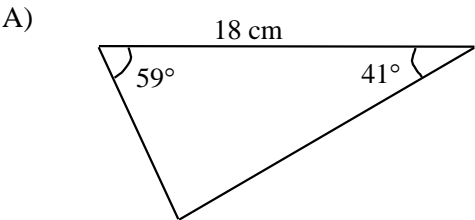


7

Given triangle PQS.

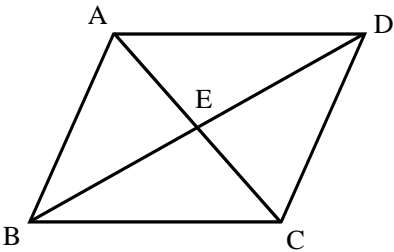


Which of the following triangles is necessarily isometric (congruent) to triangle PQS?



8

Consider parallelogram ABCD on the right. Diagonals AC and BD intersect at E. The proof below shows that $\triangle AEB$ is congruent to $\triangle CED$. **Fill in the missing part of each justification.**

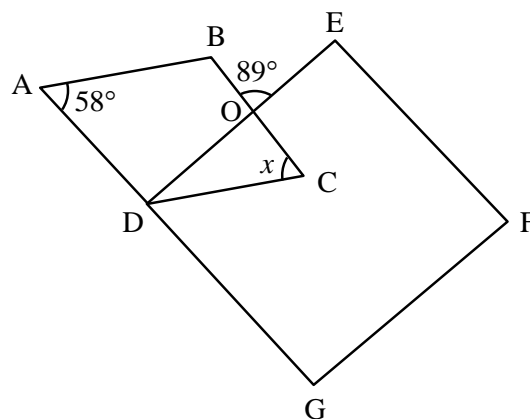


Statement	Justification
$m \angle AEB = m \angle CED$	The angles are congruent because they are ①
$m \overline{AE} = m \overline{EC}$	In a parallelogram the diagonals ②
$m \angle BAE = m \angle DCE$	The angles are congruent because they are ③, as \overline{AB} and \overline{DC} are parallel and are intersected by the transversal \overline{AC} .
$\triangle AEB \cong \triangle CED$	According to the following theorem: ④

9 The adjacent plane figure has the following characteristics:

1. Quadrilateral DEFG is a square.
2. $\overline{AB} \parallel \overline{CD}$
3. $m \angle A = 58^\circ$
4. $m \angle BOE = 89^\circ$

Match each statement with the correct justification.



Statement

Justification

A) $m \angle A = m \angle CDG = 58^\circ$

1. Vertically opposite angles are congruent.

B) $m \angle EDC = 90^\circ - 58^\circ = 32^\circ$

2. By definition, the angles of a square measure 90° .

C) $m \angle BOE = m \angle DOC = 89^\circ$

3. The sum of the interior angles of a triangle is 180° .

D) $m \angle C = 180^\circ - 89^\circ - 32^\circ = 59^\circ$

4. When a transversal intercepts two parallel lines, the alternating interior angles are congruent.

5. In a parallelogram, the opposite angles are congruent.

6. When a transversal intercepts two parallel lines, the corresponding angles are congruent.

7. Two adjacent angles on a straight line are supplementary.

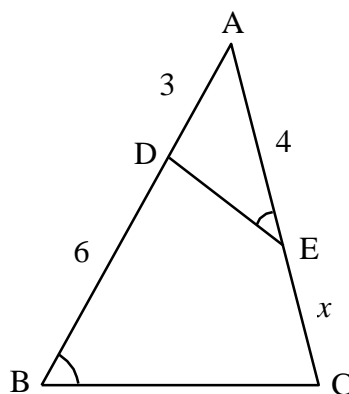
10 In triangles ABC and AED shown on the right, $\angle AED \cong \angle ABC$.

$m \overline{AD} = 3$ cm,

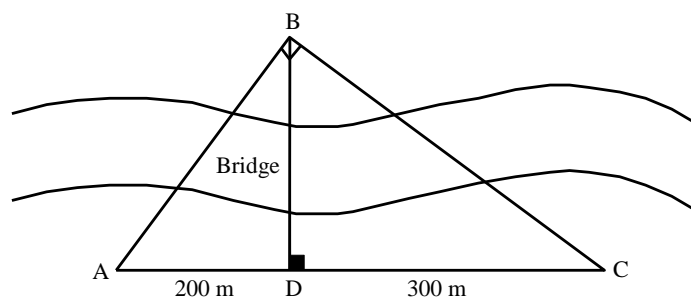
$m \overline{DB} = 6$ cm,

$m \overline{AE} = 4$ cm.

What is the measure of \overline{EC} ?



11 A land surveyor wants to know the length of the bridge that is to be built across a river. The measures are shown in the diagram. What is the length BD of the bridge?



12

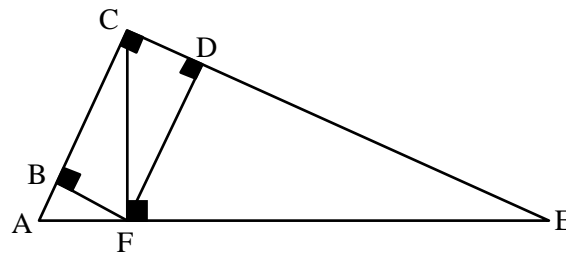
To construct the roof of a house, an architect must determine the measures of the support beams of the roof.

$$m \overline{AC} = 6 \text{ m}$$

$$m \overline{CE} = 8 \text{ m}$$

$$m \overline{AE} = 10 \text{ m}$$

What is the length of segment AF?



13

The sails of Lisa's sailboat are in the shape of two right triangles. While she was out sailing, support cable AB broke.

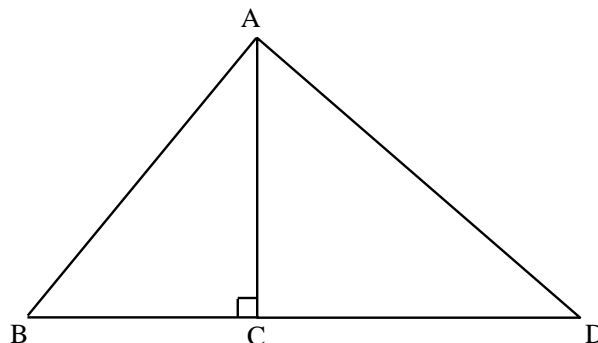
$$m \overline{CD} = 5.13 \text{ m}$$

$$m \overline{AD} = 6.7 \text{ m}$$

$$m \angle BAD = 90^\circ$$

$$m \overline{AB} = ?$$

What is the length of cable AB?



14

Guy wires AB and BC, measuring 13 m and 9 m respectively, anchor the base of a flagpole to the ground. The angle formed by the guy wires is 90° .

What is the height of the portion of the flagpole from B to its base D?

