Congruence, Similarity & Geometrical Proof

Question Paper

Course	Edexcel IGCSE Maths
Section	4. Geometry & Trigonometry
Topic	Congruence, Similarity & Geometrical Proof
Difficulty	Medium

Time allowed: 40

Score: /31

Percentage: /100

Question 1

Diagram **NOT** accurately drawn
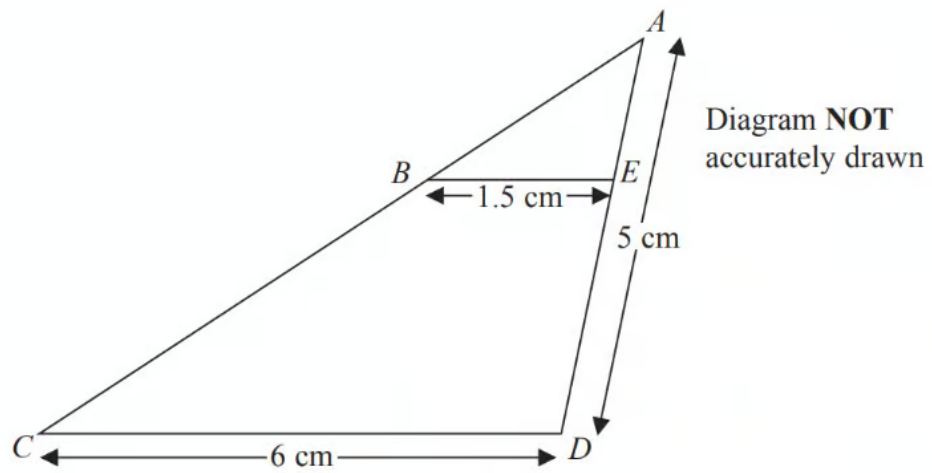
ABC and *AED* are straight lines.
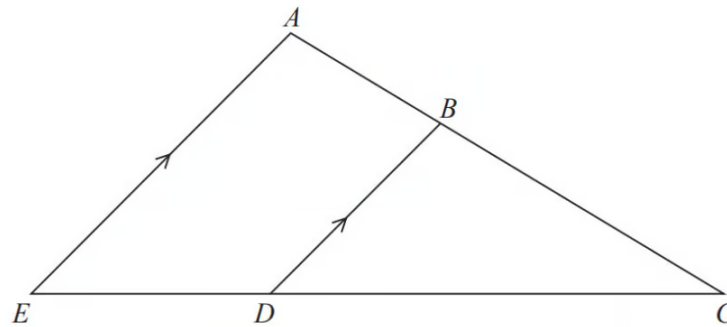*BE* and *CD* are parallel.
BE = 1.5 cm.
CD = 6 cm.
AD = 5 cm.

Calculate the length of *ED*.

[3 marks]

Question 2a

ABC and *EDC* are straight lines.
EA is parallel to *DB*.

EC = 8.1 cm.
DC = 5.4 cm.
DB = 2.6 cm,

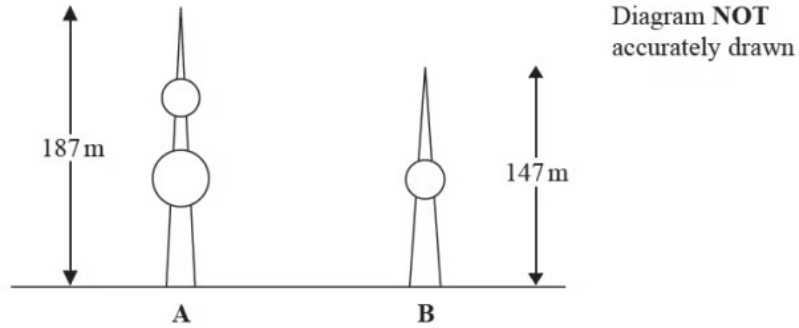Work out the length of *AE*.

[2 marks]

Question 2b

AC = 6.15 cm.

Work out the length of *AB*.

[2 marks]

Question 3

The diagram shows two water towers in Kuwait.

Diagram **NOT** accurately drawn

The real height of tower **A** is 187m.
The real height of tower **B** is 147m.

Ahmed makes a scale model of both towers.

The height of tower **A** on the scale model is 90cm.

Work out the height of tower **B** on the scale model.
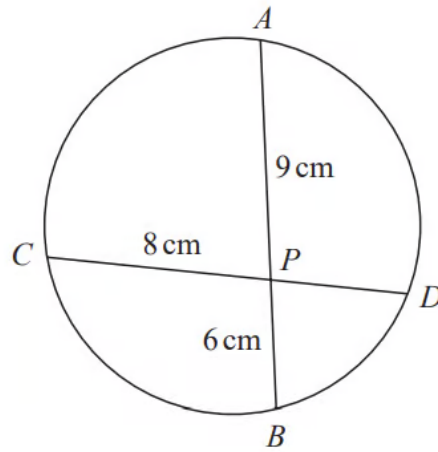Give your answer correct to the nearest centimetre.

[3 marks]

Question 4

Diagram **NOT** accurately drawn

APB and CPD are chords of a circle.

$AP = 9$ cm $PB = 6$ cm $CP = 8$ cm

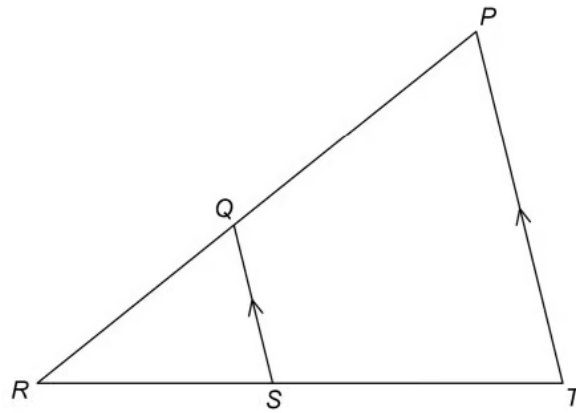Calculate the length of PD.

........................cm

[2 marks]

Question 5

PRT and *QRS* are similar triangles.

Not drawn accurately

Which of these is equivalent to $\dfrac{QR}{PR}$?

Circle your answer.
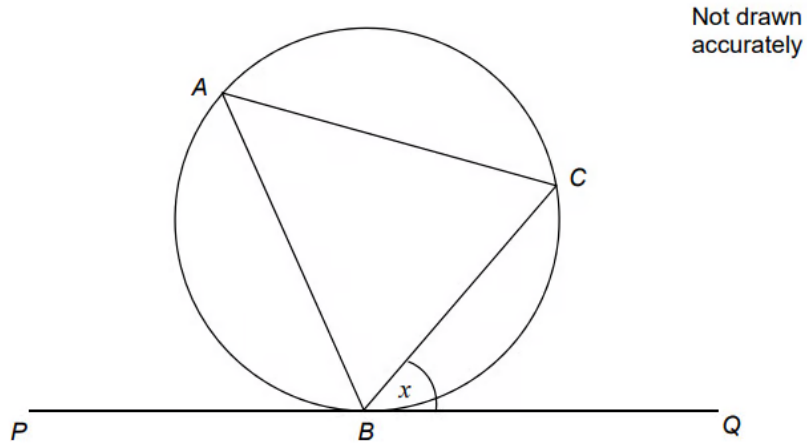
$$\frac{RS}{ST}$$

$$\frac{PT}{QS}$$

$$\frac{QS}{PT}$$

$$\frac{RT}{RS}$$

[1 mark]

Question 6

A, B and C are points on a circle.

- BC bisects angle ABQ.
- PBQ is a tangent to the circle.

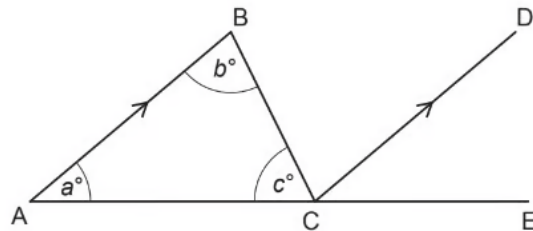Not drawn accurately

Angle $CBQ = x$

Prove that $AC = BC$

[3 marks]

Question 7a

The diagram shows triangle ABC.
CD is parallel to AB.
A, C and E lie in a straight line.
Angles of size $a°$, $b°$ and $c°$ are shown.

Not to scale

Insert $a°$, $b°°$ or $c°$ to make this statement true.
Give a reason for your answer.

Angle DCE = ... because ....

[2 marks]

Question 7b

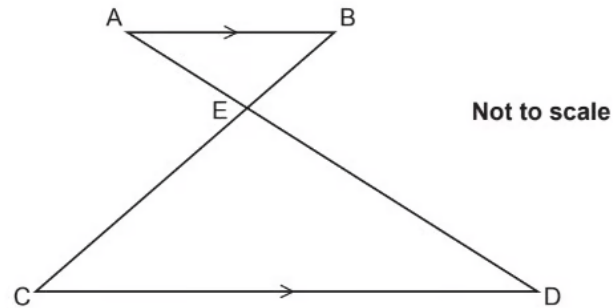Use the diagram and the answer to part (a) to show that the angles of a triangle add up to 180°.

Give a reason for each statement you make.

[3 marks]

Question 8

In the diagram AB is parallel to CD.
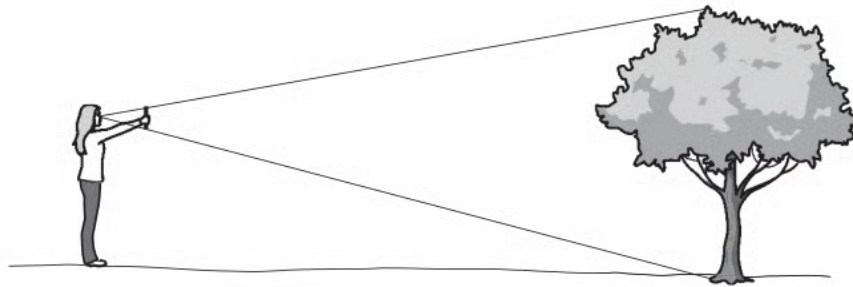AED and BEC are straight lines.

Not to scale

Prove that triangle ABE is similar to triangle CDE.

[3 marks]

Question 9a

Anna estimates the height of a tree.

Anna holds a ruler vertically so the height of the tree is exactly covered by the ruler.
She is 20 metres from the tree.
The ruler is 30cm long.
The horizontal distance from her eyes to the ruler is 60 cm.
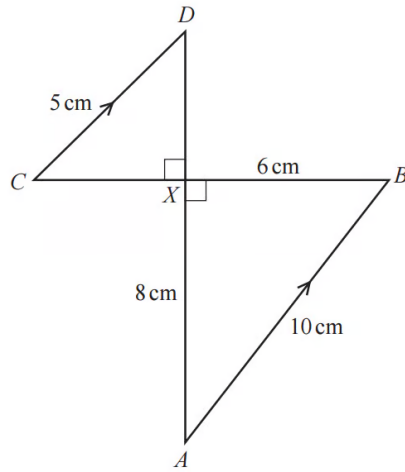
Calculate an estimate of the height of the tree.

.... m

[3 marks]

Question 9b

Give two reasons why this method may not be suitable to estimate the height of a very tall building.

[2 marks]

Question 10

NOT TO SCALE

In the diagram, *AB* and *CD* are parallel.
AD and *BC* intersect at right angles at the point *X*.
AB = 10 cm, *CD* = 5 cm, *AX* = 8 cm and *BX* = 6 cm.

Use similar triangles to calculate *DX*.

DX = ... cm

[2 marks]