Congruence, Similarity & Geometrical Proof
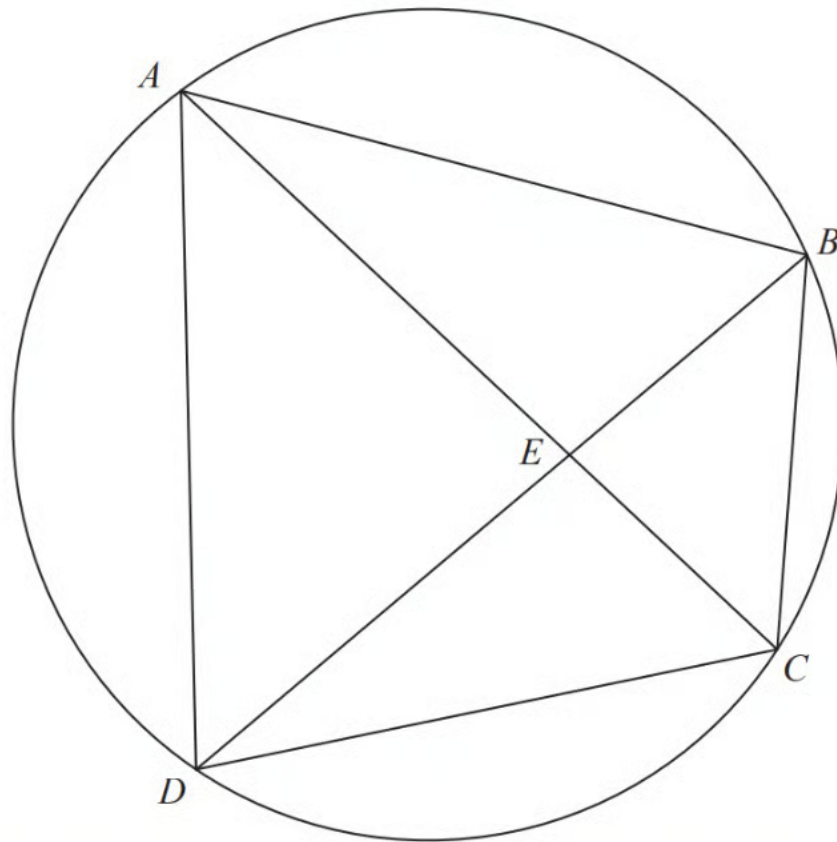
Question Paper

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

Time allowed: 40

Score: /27

Percentage: /100

Question 1

A, B, C and D are four points on the circumference of a circle.

AEC and BED are straight lines.
Prove that triangle ABE and triangle DCE are similar.
You must give reasons for each stage of your working.

[3 marks]

Question 2

Steve has a photo and a rectangular piece of card.
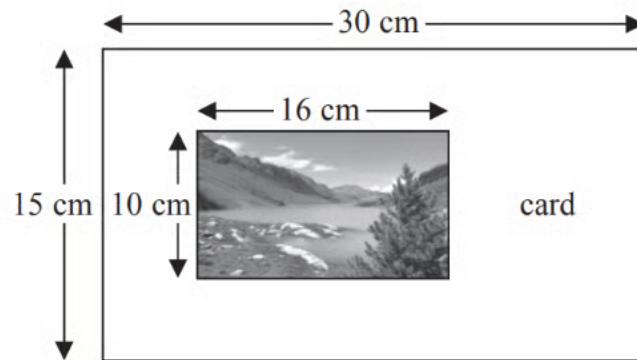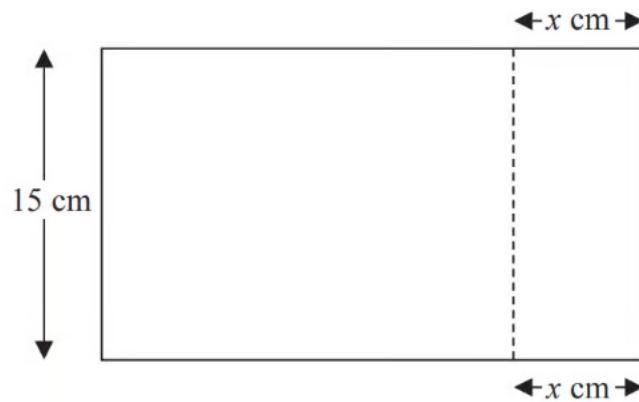

30 cm

16 cm

15 cm | 10 cm

card

Diagram **NOT** accurately drawn

The photo is 16 cm by 10 cm.
The card is 30 cm by 15 cm.

Steve cuts the card along the dotted line shown in the diagram below.

x cm

15 cm

x cm

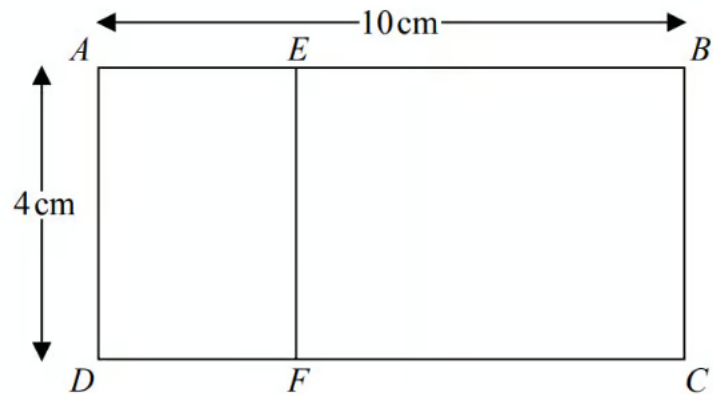Steve throws away the piece of card that is 15 cm by x cm.
The piece of card he has left is mathematically similar to the photo.

Work out the value of x.

[3 marks]

Question 3

Rectangle $ABCD$ is mathematically similar to rectangle $DAEF$.

$AB = 10$ cm.

$AD = 4$ cm.

Work out the area of rectangle $DAEF$.
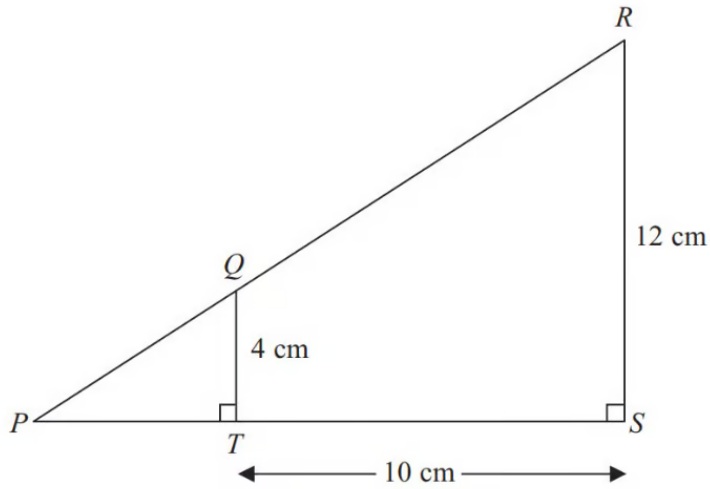
[3 marks]

Question 4a

Diagram **NOT** accurately drawn

PQR and *PTS* are straight lines.
Angle *PTQ* = Angle *PSR* = 90°.
QT = 4 cm
RS = 12 cm
TS = 10 cm

Work out the area of the trapezium *QRST*.

[2 marks]

Question 4b

Work out the length of *PT*.

[3 marks]

Question 5
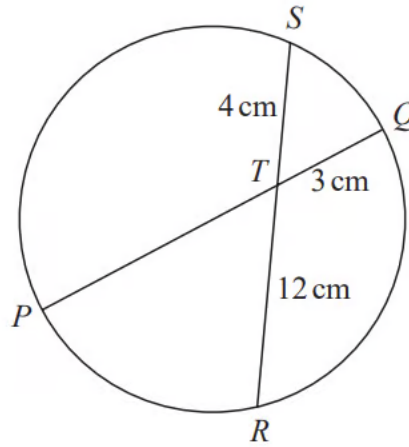
Diagram **NOT** accurately drawn

PTQ is a diameter of a circle.
RTS is a chord of the circle.

$TQ = 3$ cm $ST = 4$ cm $TR = 12$ cm
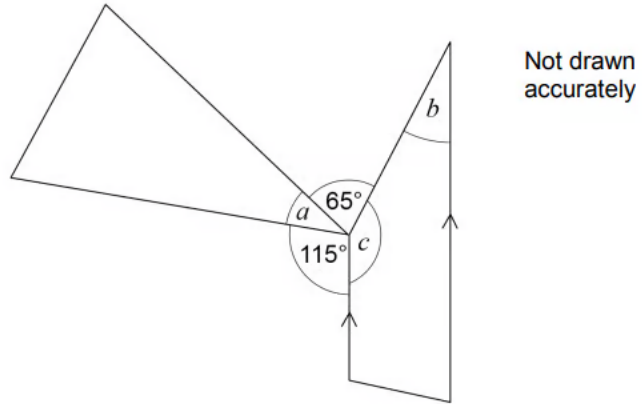
Calculate the radius of the circle.

.... cm

[3 marks]

Question 6

The diagram shows a triangle and a trapezium.
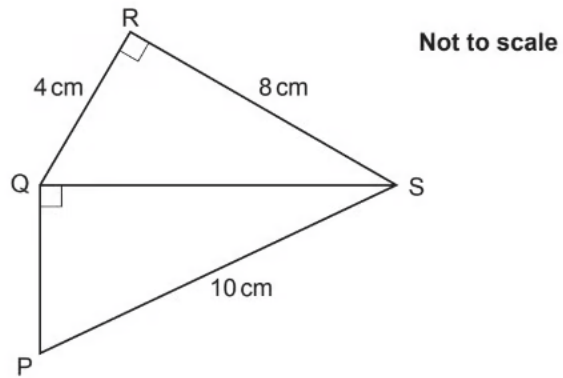

Not drawn accurately

Prove that $a = b$

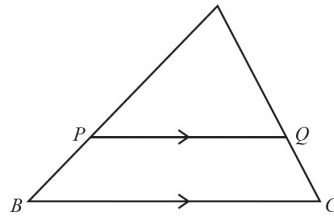[3 marks]

Question 7

The diagram below shows two right-angled triangles.

Not to scale

Prove that triangles PQS and QRS are similar.

[5 marks]

Question 8

NOT TO SCALE

In the diagram, PQ is parallel to BC.
APB and AQC are straight lines.
PQ = 8 cm, BC = 10 cm and AB = 9cm.

Calculate PB.

PB = ... cm

[2 marks]