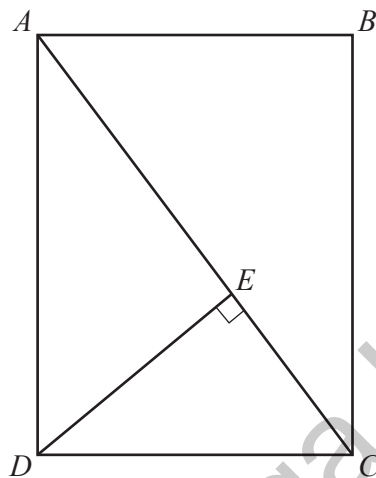


Name:

Section:

Congruence and Similarity Worksheet

1



NOT TO
SCALE

The diagram shows a rectangle $ABCD$.
 E is a point on the diagonal AC such that $\hat{DEC} = 90^\circ$.

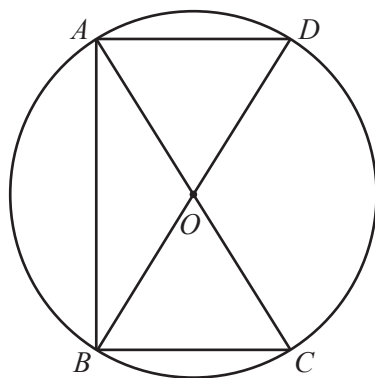
Prove that triangle ADC is similar to triangle DEC .
Give a reason for each statement you make.

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..... [3]



NOT TO
SCALE

AC and BD are diameters of the circle, centre O .

Show that triangle ABC is congruent to triangle BAD .
Give a reason for each statement you make.

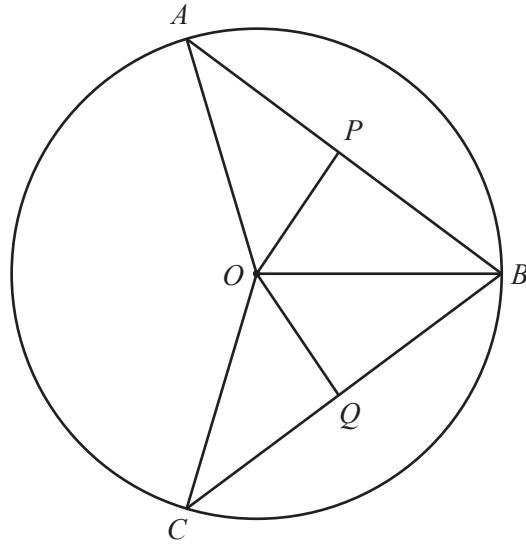
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[3]



NOT TO
SCALE

A , B and C are points on the circle centre O and $AB = BC$.
 P is the midpoint of chord AB and Q is the midpoint of chord BC .

- (a) Prove that triangle OAP is congruent to triangle OCQ .
 Give a reason for each statement you make.

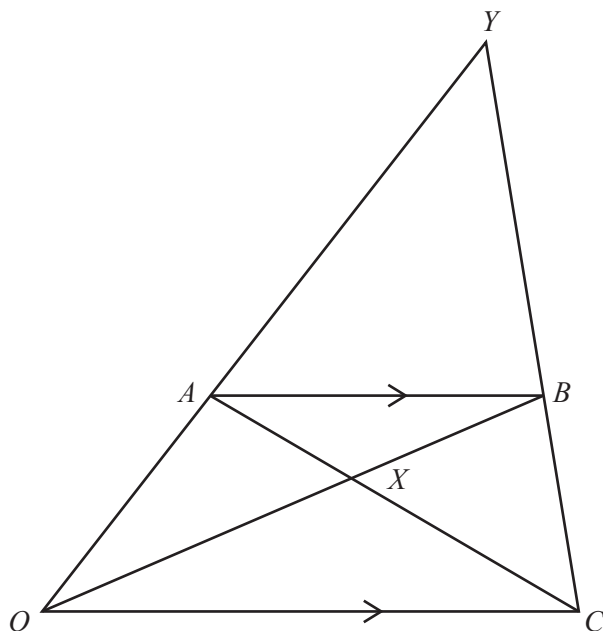
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..... [3]



OYC is a triangle.

A is a point on OY and B is a point on CY .

AB is parallel to OC .

AC and OB intersect at X .

- (a) Prove that triangle ABX is similar to triangle COX .
Give a reason for each statement you make.

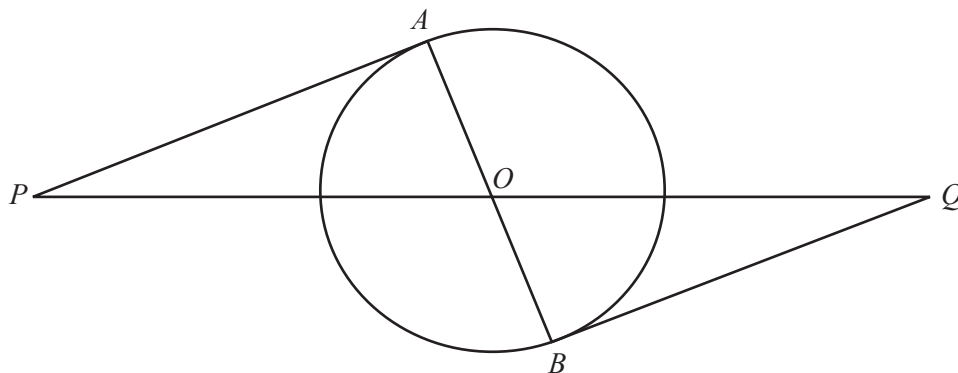
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..... [3]

5



AB is a diameter of the circle, centre O .
 PA and QB are tangents to the circle at A and B respectively.

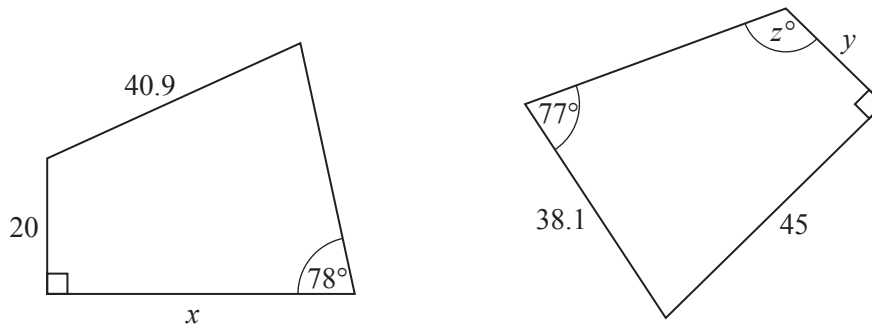
Prove that triangle PAO is congruent to triangle QBO .
Give a reason for each statement you make.

Mega Lecture

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[3]

6

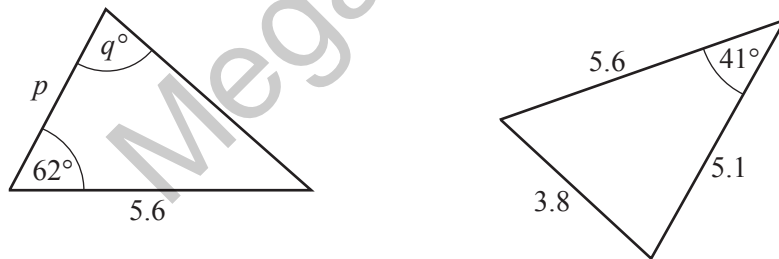


These two quadrilaterals are congruent. The lengths are in millimetres.

Find the values of x , y and z .

Answer $x = \dots\dots\dots$
 $y = \dots\dots\dots$
 $z = \dots\dots\dots$ [3]

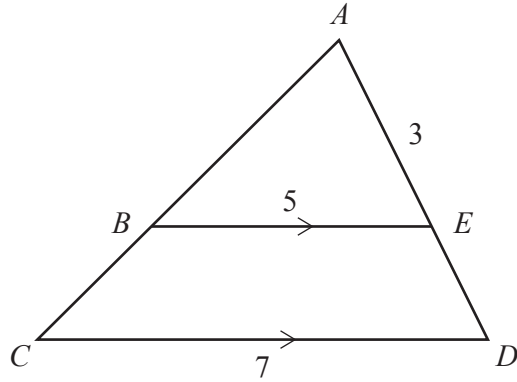
7 These two triangles are congruent.
The lengths are in centimetres, correct to the nearest 0.1 cm.



Find p and q .

Answer $p = \dots\dots\dots$
 $q = \dots\dots\dots$ [2]

8



In the diagram, $BE = 5$ cm, $CD = 7$ cm and $AE = 3$ cm.

BE is parallel to CD .

(a) Express CD as a percentage of BE .

Answer % [1]

(b) Find ED .

Answer cm [2]

- 9 Two bottles are geometrically similar.
The ratio of the areas of their bases is 1 : 4.

Write down the ratios of their

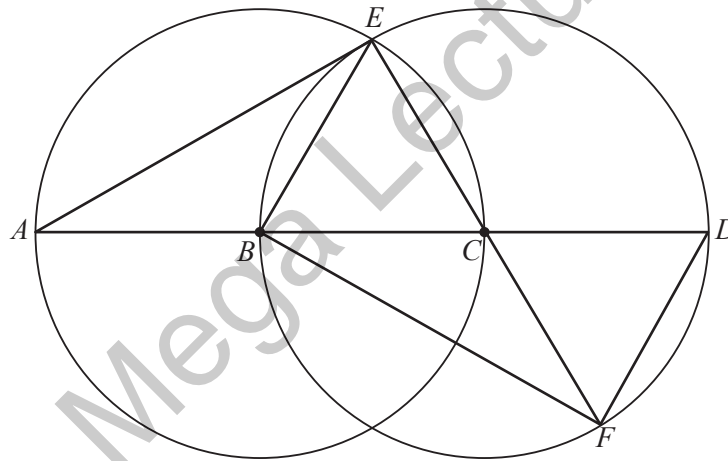
- (a) heights,

Answer : [1]

- (b) volumes.

Answer : [1]

- 10 (a) The diagram shows two circles with equal radii.
 A, E and C are points on the circle, centre B .
 B, E, D and F are points on the circle, centre C .
 $ABCD$ is a straight line.



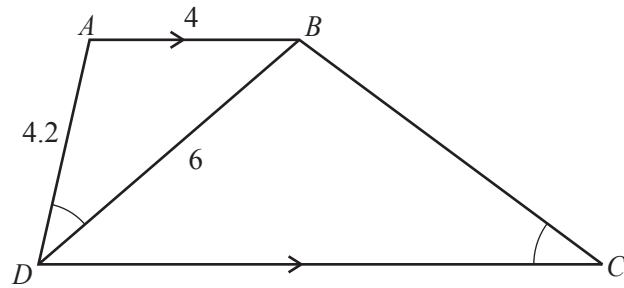
- (i) Show that triangles AEC and FBE are congruent.

[3]

- (ii) State another triangle that is congruent to triangle AEC .

Answer Triangle [1]

11 In the diagram, AB is parallel to DC and $\hat{A}DB = \hat{B}CD$.



(a) Explain why triangles ABD and BDC are similar.

[2]

(b) $AB = 4$ cm, $BD = 6$ cm and $AD = 4.2$ cm.

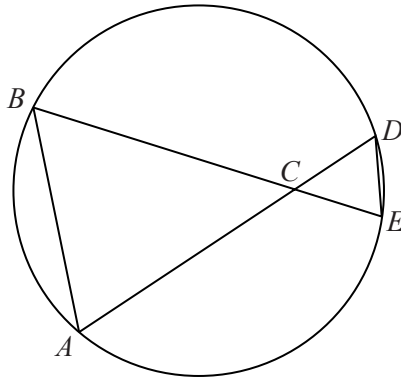
(i) Calculate BC .

Answer cm [2]

(ii) Write down the value of $\frac{\text{area of triangle } ABD}{\text{area of triangle } BDC}$.

Answer [1]

12 A, B, D and E are points on a circle.



AD and BE intersect at C .

- (i) Show that triangles ABC and EDC are similar.
Give your reasons.

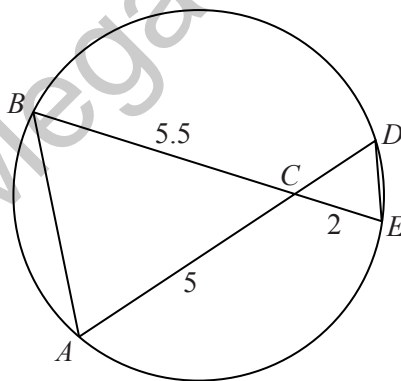
Answer

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..... [2]

(ii)



Given that $AC = 5$ cm, $BC = 5.5$ cm and $CE = 2$ cm, find the length of the chord AD .

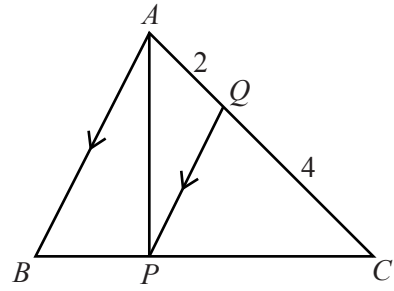
Answer cm [2]

13 In the diagram, the points P and Q lie on the sides BC and AC of triangle ABC .

AB is parallel to QP .
 $AQ = 2$ cm and $QC = 4$ cm.

The area of triangle CPQ is 6 cm^2 .

Find the area of



(a) triangle AQP ,

..... cm^2 [1]

(b) triangle ABC ,

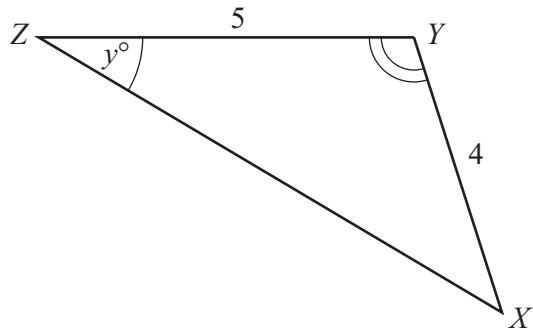
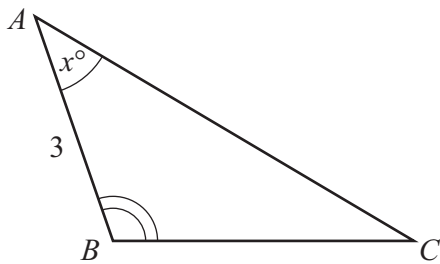
..... cm^2 [1]

(c) triangle ABP .

..... cm^2 [1]

Mega Lecture

14



The triangles ABC and XYZ are similar and $\hat{A}BC = \hat{X}YZ$.

$\hat{B}AC = x^\circ$, $\hat{Y}ZX = y^\circ$ where $x \neq y$.
 $AB = 3$ cm, $XY = 4$ cm and $YZ = 5$ cm.

(a) Express $\hat{A}BC$ in terms of x and y .

Answer $\hat{A}BC = \dots\dots\dots$ [1]

(b) Find BC .

Answer $BC = \dots\dots\dots$ cm [1]

(c) Write down the value of $\frac{\text{area of triangle } ABC}{\text{area of triangle } XYZ}$.

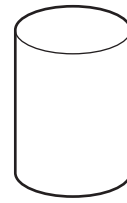
Answer $\dots\dots\dots$ [1]

- 15** These two cylinders are similar.
The ratio of their volumes is $8 : 27$.
The height of cylinder A is 12 cm.

Find the height of cylinder B .



A



B

Answer cm [2]

Mega Lecture