Write your name, centre number and candidate number in the boxes below.

Surname	Other names

Centre number | | | | | |

Candidate number | | | | |

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Similarity

Time allowed: 50 minutes

Subject code **0580**

Mathematics

Questions from Paper 1, Paper 2 and Paper 4

You must have: a ruler marked in centimetres and millimetres, a protractor, compasses, a pen, an HB pencil and an eraser.
You may use a calculator.

Total marks

/ 39

Instructions

- Answer every question in the space provided on this paper.
- Write in black or dark blue ink. Pencil may be used for diagrams and graphs.
- Fill in your name, centre number and candidate number above.
- Show your working: a correct method can earn marks even if the answer is wrong.
- Unless a question says otherwise, give answers that are not exact to 3 significant figures, and angles in degrees to 1 decimal place.

Information

- This paper has 10 questions worth 39 marks in total.
- The marks for each question or part are shown in brackets, for example [3].

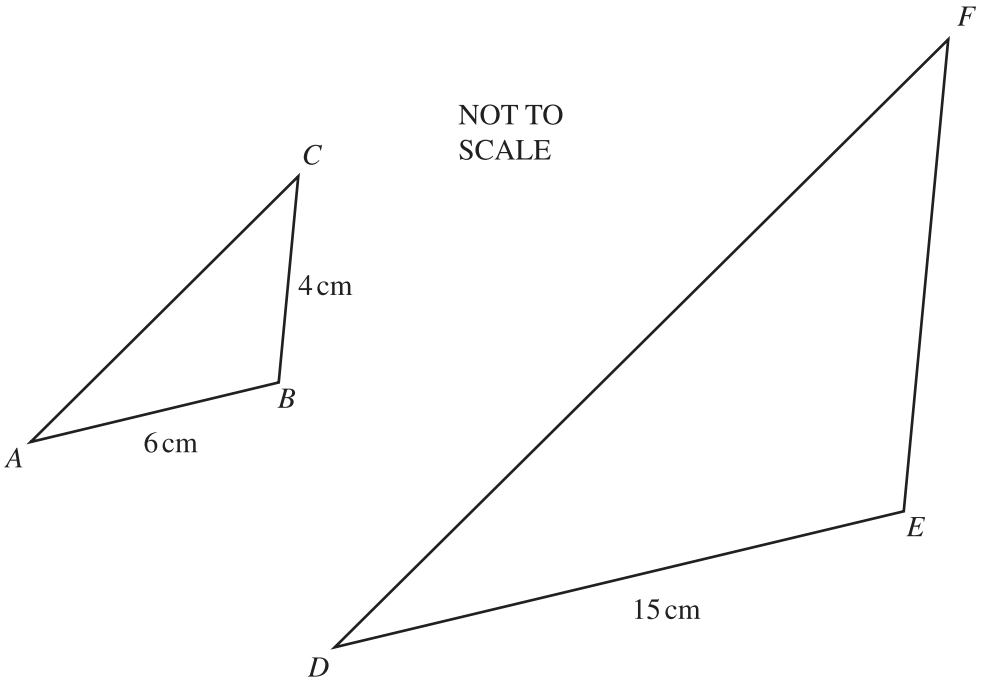
Advice

- Read every question through once before you write anything.
- Use the marks in brackets to judge how long to spend on each part.
- If you finish early, go back and check your working.

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Print at 100% (Actual size) so diagrams keep their real measurements.

1



The triangles *ABC* and *DEF* are similar.
AB = 6 cm, *BC* = 4 cm and *DE* = 15 cm.

Calculate *EF*.

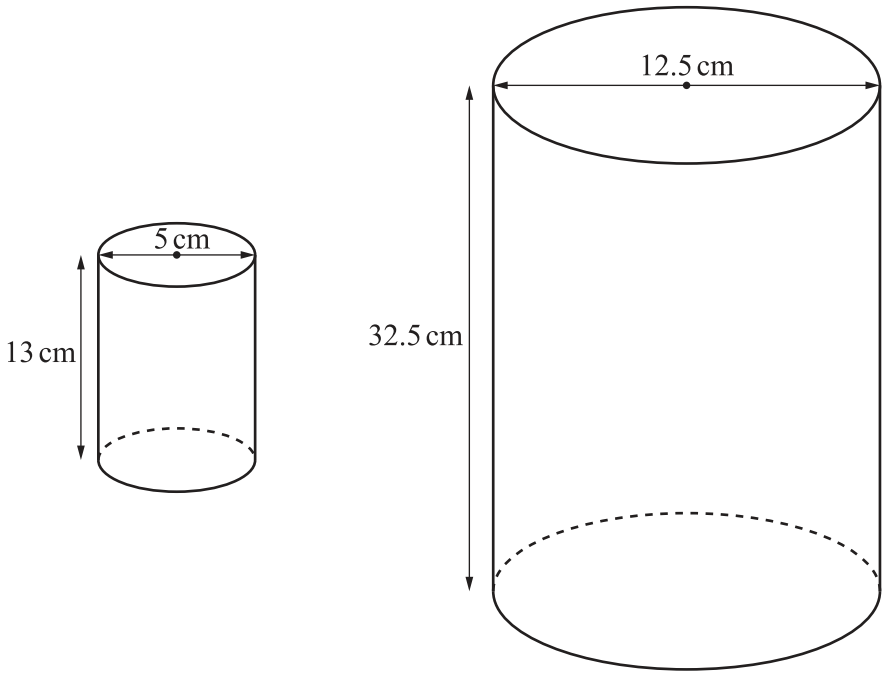
Answer EF = ... cm [2]

Similar lengths Click for more variations

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2

NOT TO SCALE



The diagram shows two cylinders.

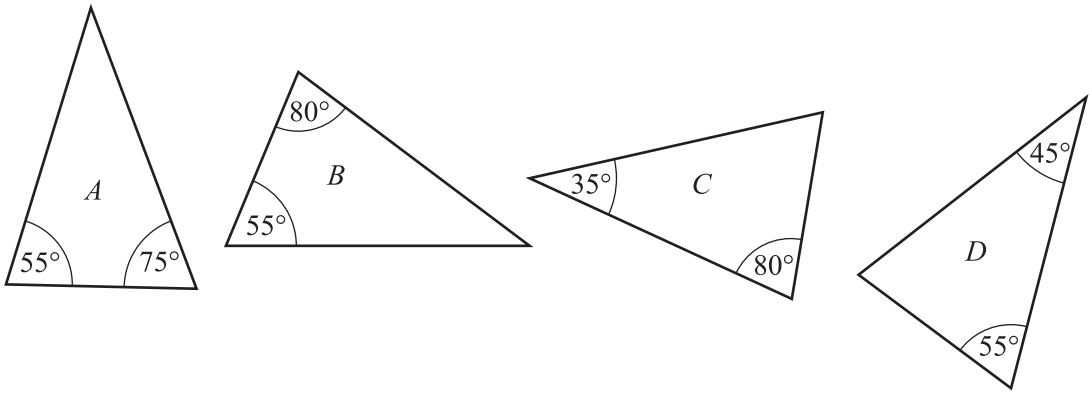
Show that the two cylinders are mathematically similar.

[2]

Similarity Click for more variations

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3 **(a)**



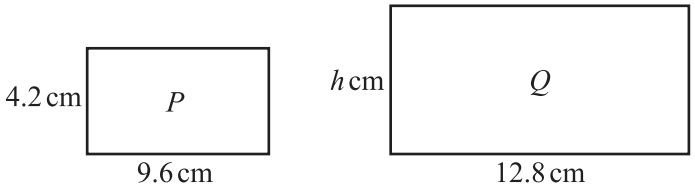
NOT TO SCALE

Two of these triangles are similar.

Write down the letters of these two triangles.

..... and ..... [1]

(b)



NOT TO SCALE

Rectangle P is similar to rectangle Q.

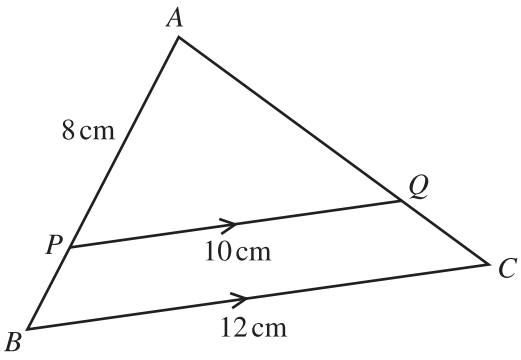
Work out the value of h.

h = ... [2]

(a) Similarity (b) Similar lengths Click for more variations

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4



NOT TO SCALE

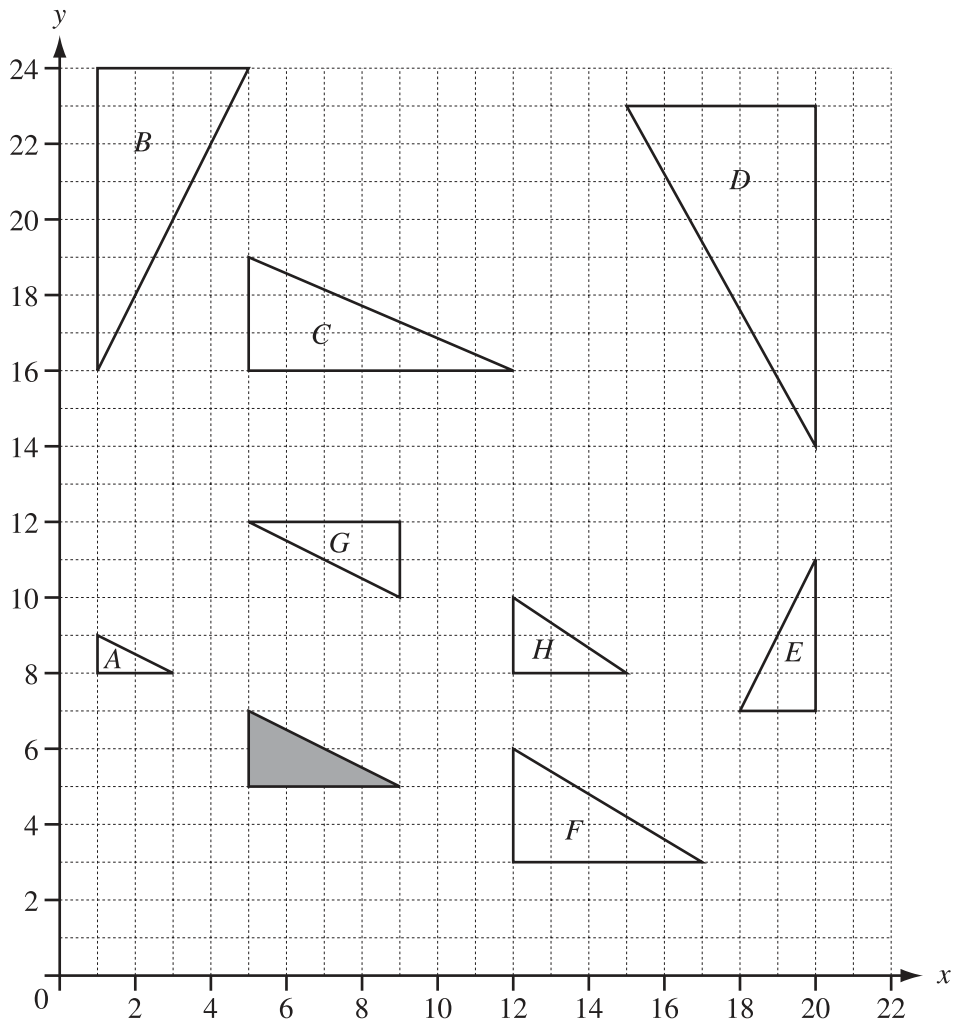
APB and *AQC* are straight lines. *PQ* is parallel to *BC*.
AP = 8 cm, *PQ* = 10 cm and *BC* = 12 cm.
Calculate the length of *AB*.

Answer AB = ... cm [2]

Similar lengths Click for more variations

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5



Write down the letters of all the triangles which are

(a) congruent to the shaded triangle,

Answer(a) ..... [2]

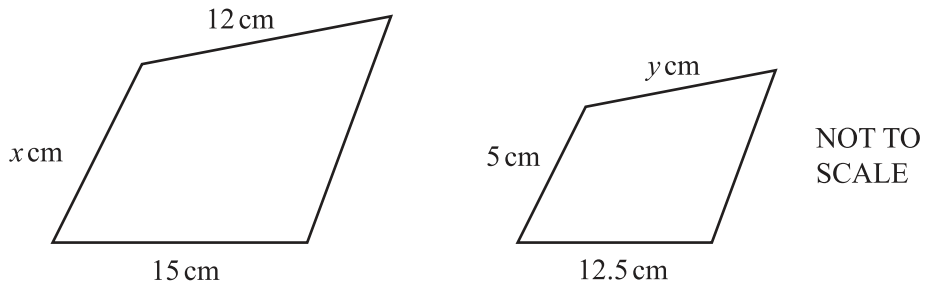
(b) similar, but not congruent, to the shaded triangle.

Answer(b) ..... [2]

(a) Congruence (b) Similarity Click for more variations

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6



The two shapes are mathematically similar.

Find the value of

(a) x,

$x =$ ..... [2]

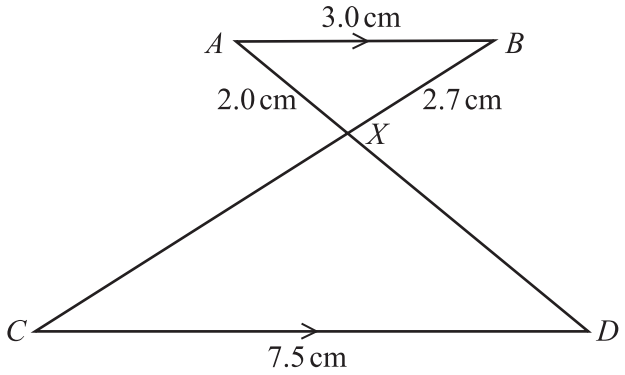
(b) y.

$y =$ ..... [2]

(a) Similar lengths (b) Similar lengths Click for more variations

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7



NOT TO SCALE

In the diagram, AB and CD are parallel.
The lines CB and AD intersect at X.
$AB = 3.0$ cm, $AX = 2.0$ cm, $BX = 2.7$ cm and $CD = 7.5$ cm.

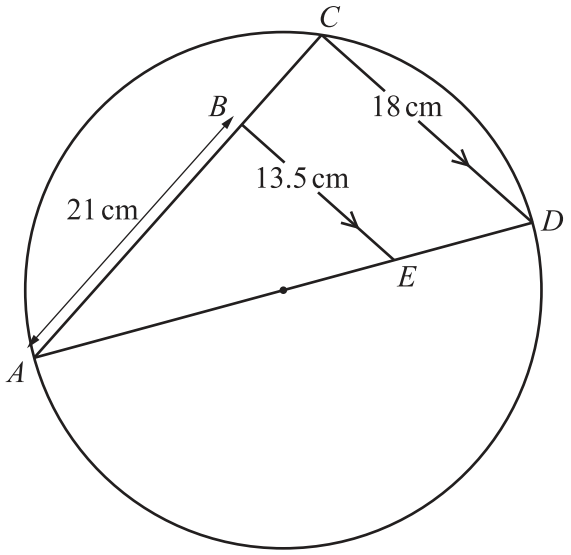
Find the length of BC.

$BC =$ ..... cm [3]

Similar lengths Click for more variations

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8



NOT TO SCALE

C lies on a circle with diameter AD.
B lies on AC and E lies on AD such that BE is parallel to CD.
$AB = 21$ cm, $CD = 18$ cm and $BE = 13.5$ cm.

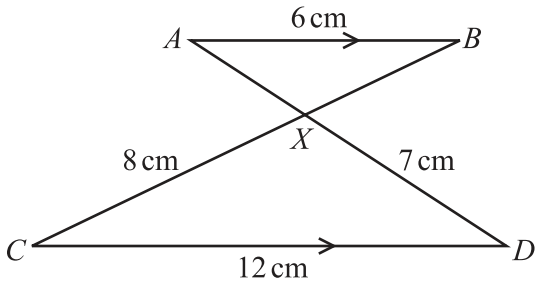
Work out the radius of the circle.

..... cm [5]

Pythagoras' theorem Click for more variations

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9



NOT TO SCALE

In the diagram, AB is parallel to CD.
AD and BC intersect at X.
$AB = 6\,\text{cm}$, $CD = 12\,\text{cm}$, $CX = 8\,\text{cm}$ and $DX = 7\,\text{cm}$.

(a) Complete the statement.

Triangle ABX is ..... to triangle DCX. [1]

(b) Work out the length of BX.

$BX =$ ..... cm [2]

(c) The area of triangle DCX is $26.906\,\text{cm}^2$.

Use this value to find the area of

(i) triangle ABX,

..... cm^2 [2]

(ii) triangle ACX.

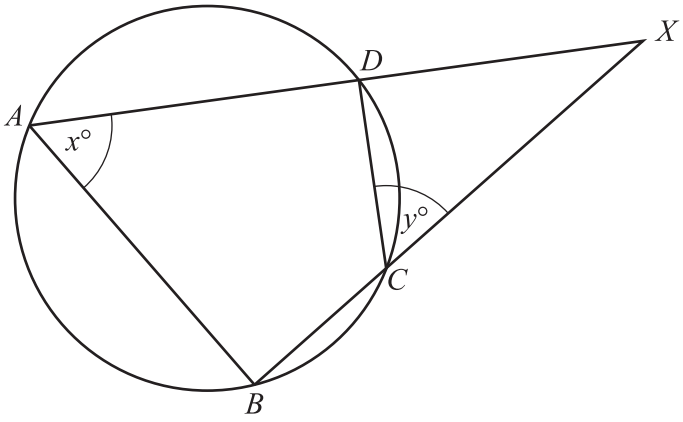
..... cm^2 [1]

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(a) Similarity (b) Similar lengths (c)(i) Similar areas and volumes (c)(ii) Similar areas and volumes

Click for more variations

10



NOT TO SCALE

A, B, C and D are points on a circle.
ADX and BCX are straight lines.
Angle $BAD = x°$ and angle $DCX = y°$.

(a) Explain why $x = y$.
Give a geometrical reason for each statement you make.

[2]

(b) Show that triangle ABX is similar to triangle CDX.

[2]

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(c) $AD = 15\,\text{cm}$, $DX = 9\,\text{cm}$ and $CX = 12\,\text{cm}$.

(i) Find BC.

$BC =$ ..... cm [3]

(ii) Complete the statement.

The ratio area of triangle ABX : area of triangle CDX = ... : 1. [1]

(a) Circle theorems (b) Similarity (c)(i) Similar lengths (c)(ii) Similar areas and volumes

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