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Teaching of Mathematics

MathsHUBS

GCSE QUESTIONS IN MATHEMATICS

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What would you expect?

On your table are some GCSE questions.

Some are from Foundation papers.

Some are from Higher papers.

Some appear on both.

What makes each of these a ‘challenging question’?

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7 **(a)** Simplify.

$$7t - 6u + 5t - 4u$$

(a) ..... **[2]**

(b) Factorise.

$$5v + 20w$$

(b) ..... **[1]**

(c) Solve by factorising.

$$x^2 + 10x + 21 = 0$$

- F

(c) $x =$ ..... or $x =$ ..... **[3]**

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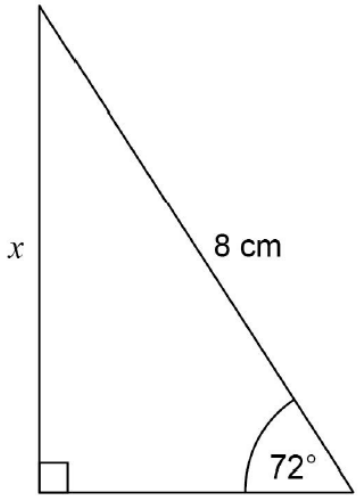
29 Use trigonometry to work out the length x.



Not drawn accurately

- F

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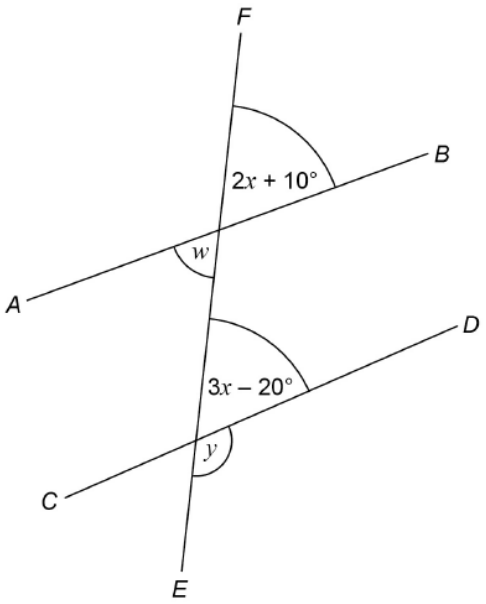
10 *AB*, *CD* and *EF* are straight lines.



Not drawn accurately

10 (a) Ava assumes that *AB* and *CD* are parallel.

What answer should she get for the size of angle y?

[4 marks]

10 (b) In fact,

AB and *CD* are **not** parallel

angle w is 60°

What effect does this have on the size of angle y?

Tick a box.

☐ y is bigger

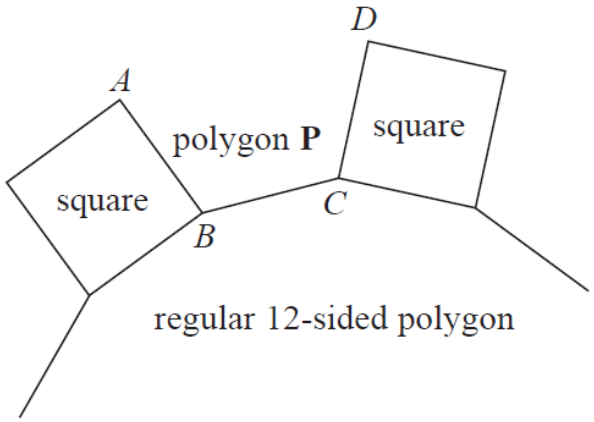
☐ y is the same

☐ y is smaller

Show working to support your answer.

- H & F

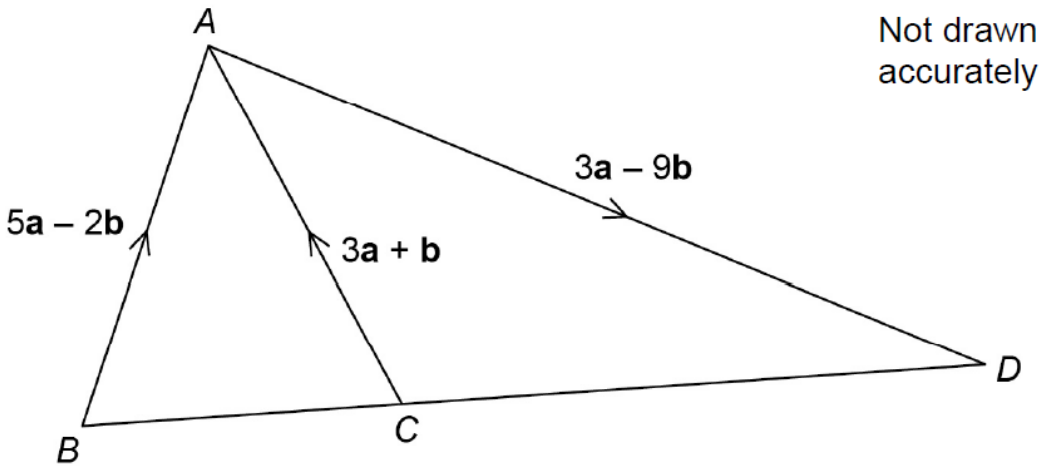
19 In the diagram, AB, BC and CD are three sides of a regular polygon **P**.



Show that polygon **P** is a hexagon.
You must show your working.

- H &F

23



Is *BCD* a straight line?

Show working to support your answer.

●H

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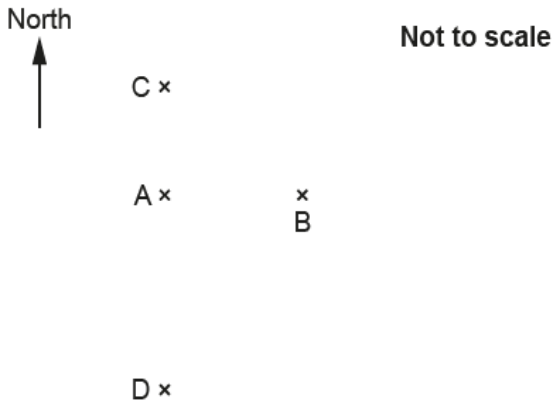
22 A, B, C and D are four towns.

B is 25 kilometres due East of A.
C is 25 kilometres due North of A.
D is 45 kilometres due South of A.



Not to scale

(a) Work out the bearing of B from C.

- H &F

(a) ..... ° **[2]**

(b) Calculate the bearing of D from B.

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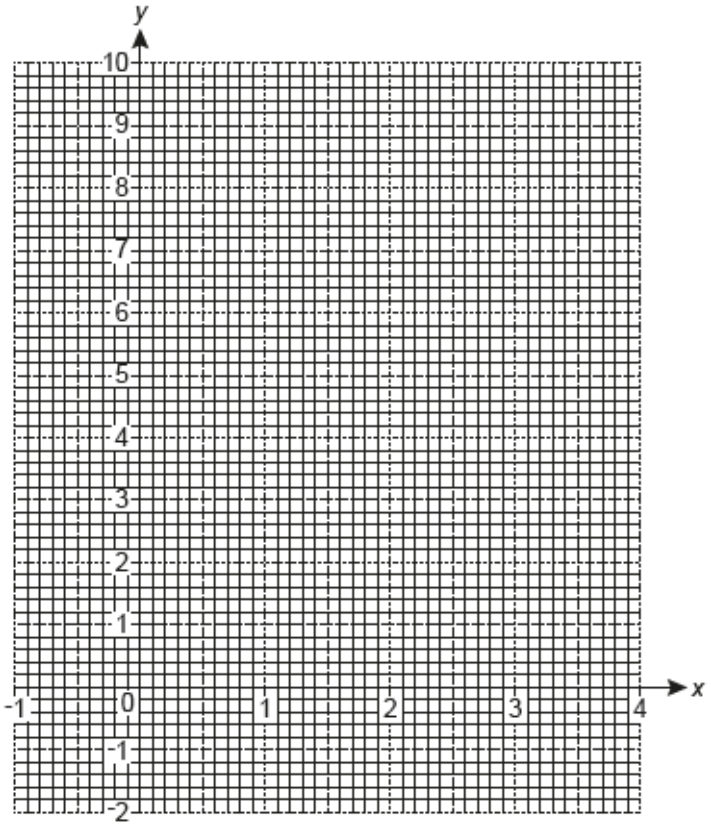
7 **(a)** Complete the table for $y = x^2 - 2x$.

x	-1	0	1	2	3	4
y	3	0	-1	0	3	

[1]

(b) Draw the graph of $y = x^2 - 2x$ for $-1 \leqslant x \leqslant 4$.



(c) Use your graph to solve $x^2 - 2x = 2$.

- H & F

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7 (a) The length of a pipe is 6 metres to the nearest metre.

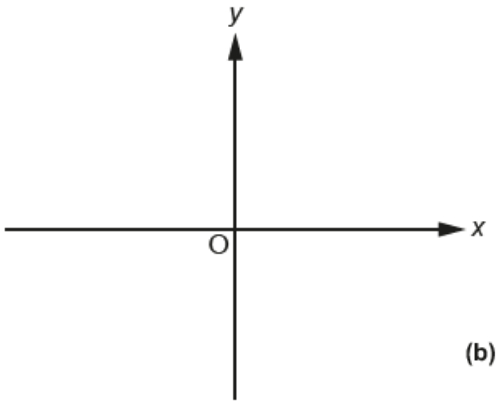
Complete the error interval for the length of the pipe.

[2 marks]

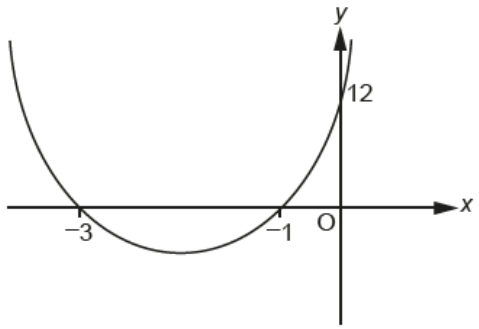
Answer _____ m ⩽ length < _____ m

●H

19 **(a)** Sketch the graph of $y = (x-2)^2 - 3$.
Show the coordinates of any turning points.



(b) The sketch shows part of a graph which has equation $y = ax^2 + bx + c$.



Not to scale

Find the values of a, b and c.

●H

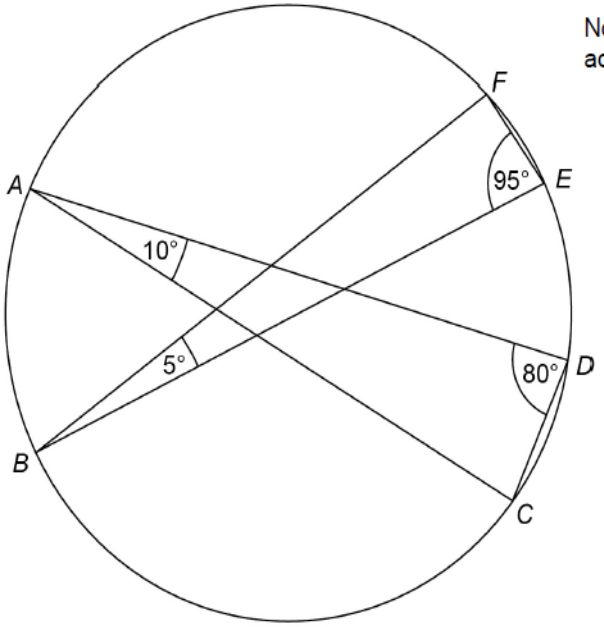
12 The points A, B, C and D lie in order on a straight line.

$$AB : BD = 1 : 5$$
$$AC : CD = 7 : 11$$

Work out $AB : BC : CD$

- H

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



●H

Circle the line that is a diameter of the circle.

[1 mark]

BE *AD* *AC* *BF*

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2 Solve the simultaneous equations

$$3x + y = -4$$
$$3x - 4y = 6$$

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27 Prove that $x^2 + x + 1$ is always positive.

- H

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Generalities

Topics that challenged ‘Higher’ pupils:

Proof

Inequalities

Negative numbers

Units (converting, compound measures)

Ratio and proportion

Geometric reasoning

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Generalities

Topics that challenged ‘Foundation’ pupils:
Metric units
Bearings
Algebra (particularly factorising and substitution)
Simultaneous equations
Fractions, decimals and percentages
Ratio and proportion


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