

Angle facts, triangles and parallel lines

About 45 minutes No calculator 39 marks



Hints online, answers free with an account:
mathswariz.uk/worksheets/gcse-angle-facts-triangles-and-parallel-lines/

Date _____

A Do Now

The first question is what today's lesson needs. The others bring back earlier topics.

- A1** Needed today [2 marks] **A2** From chapter 4 [2 marks]
- Four angles meet at a point. In degrees, they are x , $2x$, $3x - 23$ and $x + 61$. Find the largest of the four angles.
- Each term of a sequence is the sum of the two terms before it. The 3rd term is 29 and the 5th term is 72. Find the 2nd term.

Answer

Answer

- A3** Last lesson [2 marks] **A4** Key Stage 3 [2 marks]
- After a 40% increase, a ticket costs £112. What did it cost before?
- The point $(-1, 4)$ is reflected in the line $y = 1$. Find the coordinates of its image.

Answer

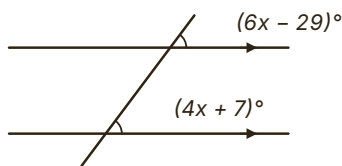
Answer

B Example, then your turn

Your teacher works through each example with you. Then try the one beside it.

EXAMPLE 1

The two lines are parallel. Work out the value of x , and the size of each angle.

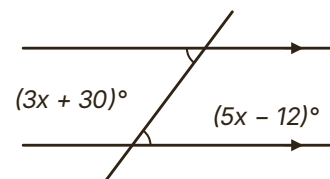


Not drawn accurately

Hint Corresponding angles are equal, so set the two expressions equal.

B1 [3 marks]

The two lines are parallel. Work out the value of x , and the size of each angle.

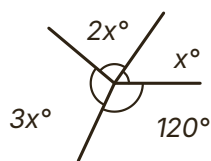


Not drawn accurately

Answer $x = \dots\dots$ angle = $\dots\dots^\circ$

C Practice

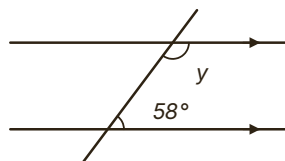
- C1** Four angles meet at a point. Work out the value of x . [2 marks]



Not drawn accurately

Answer

- C2** A straight line crosses two parallel lines. Work out the size of angle y . Give a reason for your answer. [2 marks]



Not drawn accurately

Answer

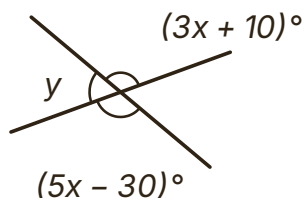
- C3** The angles of a triangle are in the ratio 2 : 3 : 7. Work out the size of the largest angle. [2 marks]

Answer

- C4** An isosceles triangle has one angle of 112° . Work out the size of each of its other two angles. [2 marks]

Answer

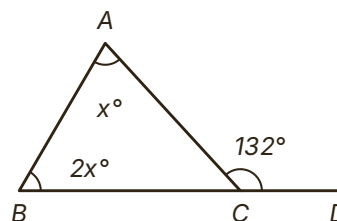
- C5** Two straight lines cross. Work out the value of x , and then the size of angle y . [3 marks]



Not drawn accurately

Answer $x = \dots\dots$ $y = \dots\dots^\circ$

- C6** In triangle ABC the side BC is extended to D . Work out the value of x . [2 marks]



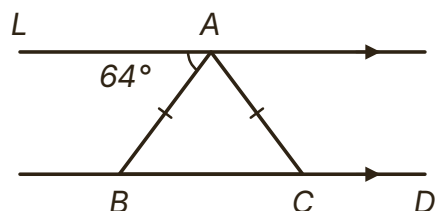
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Answer

D Exam-style questions

- D1** Amir says, "A triangle can have angles of x° , $(x + 60)^\circ$ and $(x + 150)^\circ$." [2 marks]
Explain why Amir is wrong.

D2 LA is parallel to BCD . In triangle ABC , $AB = AC$. Angle $LAB = 64^\circ$.



Not drawn accurately

(a) Work out angle ABC . Give a reason for your answer.

[2 marks]

Answer

(b) Work out angle ACB . Give a reason for your answer.

[2 marks]

Answer

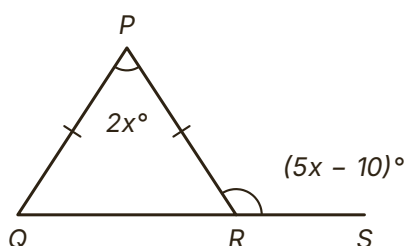
(c) Work out angle BAC and angle ACD .

[2 marks]

Answer $BAC = \dots\dots^\circ$ $ACD = \dots\dots^\circ$

Total for D2: 6 marks

D3 PQR is an isosceles triangle with $PQ = PR$. The side QR is extended to S . Angle $QPR = 2x^\circ$ and angle $PRS = (5x - 10)^\circ$. Work out the size of angle QPR . You must show your working. [4 marks]



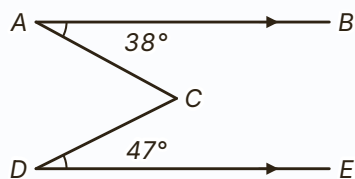
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Answer

E Extension

No route is given. The hints are at the end of the sheet. Use one at a time.

- E1** AB is parallel to DE . Angle $BAC = 38^\circ$ and angle $EDC = 47^\circ$. Work out angle ACD . [3 marks]



Not drawn accurately

Answer

Extension hints

Cover these with paper. Uncover one at a time.

- E1** **Hint 1** Draw a line through C parallel to AB .
Hint 2 The part of angle ACD above it is alternate to 38° .
Hint 3 The part below it is alternate to 47° , so $ACD = 38 + 47 = 85^\circ$.

How did it go?

Colour one circle on each line: not yet, nearly, yes.

I can use angle facts for lines, points and triangles.



I can use vertically opposite angles and the exterior angle of a triangle.



I can find angles at parallel lines and give the reason.

