GCSE Maths – Geometry and Measures

Properties of Triangles and Quadrilaterals

Worksheet

WORKED SOLUTIONS

This worksheet will show you how to work out different types of [topic] questions. Each section contains a worked example, a question with hints and then questions for you to work through on your own.

Section A

Worked Example

Calculate angle x

Step 1: Use properties of quadrilaterals to calculate the other angles.

Opposite angles are equal so in the quadrilateral there are two angles equal to x and two angles measuring $111°$.

Step 2: Set up an equation using the fact that angles in a quadrilateral add up to $360°$.

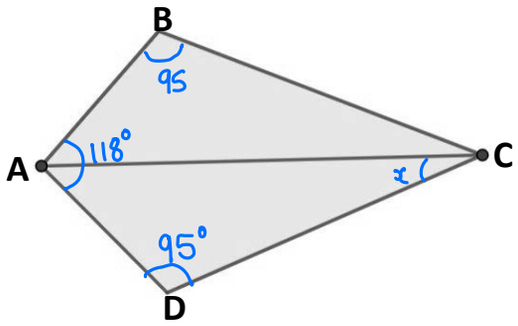
$$x + x + 111° + 111° = 360°$$
$$2x + 222° = 360°$$

Step 3: Solve the equation.

$$2x + 222° = 360°$$
$$2x = 138°$$
$$x = 69°$$

Guided Example

In the kite, angle DAB is $118°$ and angle CDA is $95°$. Calculate angle ACD.



Step 1: Use properties of quadrilaterals and triangles to calculate the other angles.

kite → ∠CDA = ∠CBA

Step 2: Set up an equation using the fact that angles in a quadrilateral add up to 360°.

95 + 95 + 118 + ∠DCB = 360

∠DCB + 308 = 360

−308

Step 3: Solve the equation.

∠DCB = 52°

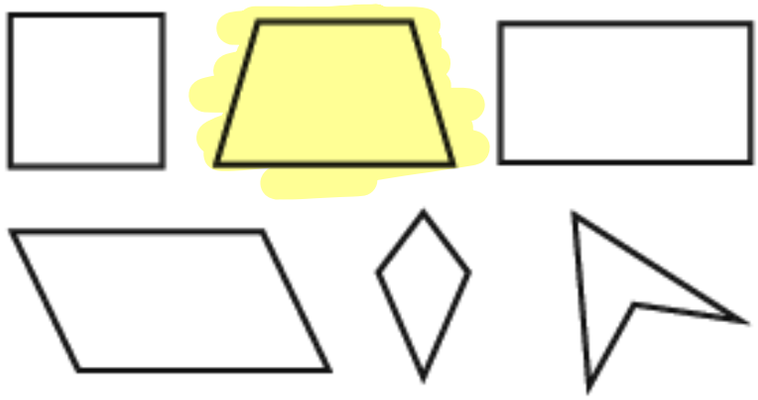
∠ACD is half of ∠DCB (bisects)

∠ACD = 52 ÷ 2

= 26°

Now it's your turn!
If you get stuck, look back at the worked and guided examples.

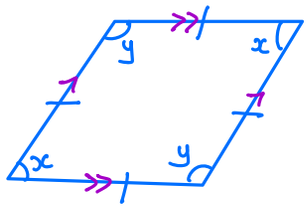
1. Shade the trapezium – 1 pair of parallel lines



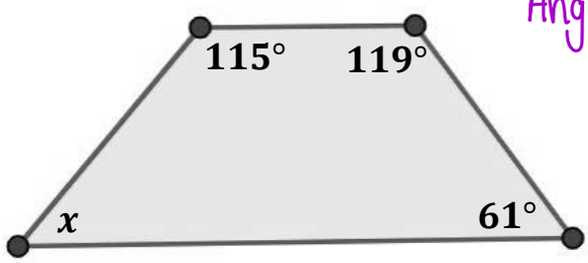
2. Give 2 properties of a Rhombus.

Any two of the three

- 2 pairs of parallel sides
- 4 equal side lengths
- Opposite angles are equal



3. Calculate angle x.



Angles in quadrilateral at to 360

$x + 115 + 119 + 61 = 360$

$x + 295 = 360$

-295

$x = 65$

4. Calculate angle y.

Cointerior angles add to 180

$y + 81 = 180$

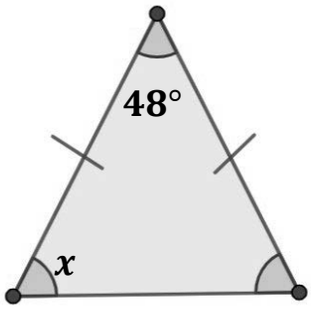
-81

$y = 99$

Section B

Worked Example

Calculate angle x.



Step 1: Identify the unlabelled angle.

Base angles in an isosceles triangle are equal. Therefore, the unlabelled angle is also equal to x.

Step 2: Use the fact that angles in a triangle add up to $180°$ to set up an equation.

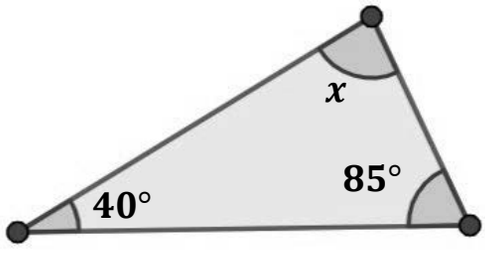
$$x + x + 48° = 180°$$

Step 3: Solve the equation.

$$2x + 48° = 180°$$
$$2x = 132°$$
$$\boldsymbol{x = 66°}$$

Guided Example

Calculate angle x.



Step 1: Use the fact that angles in a triangle add up to $180°$ to set up an equation.

$40 + 85 + x = 180$

$125 + x = 180$

Step 2: Solve the equation.

$125 + x = 180$

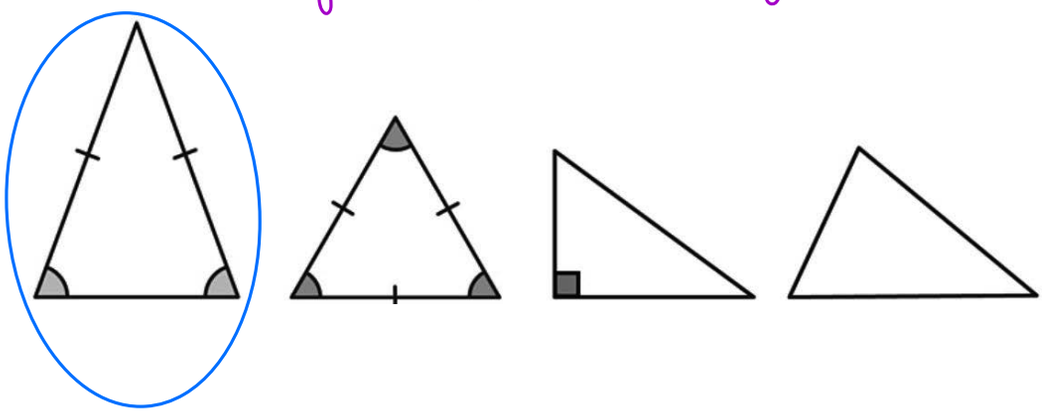
-125

$x = 55$

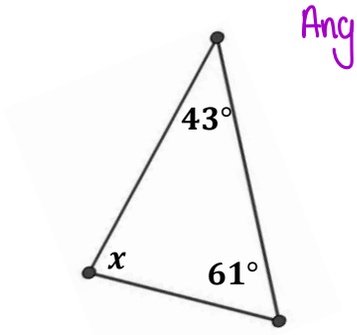
Now it's your turn!
If you get stuck, look back at the worked and guided examples.

5. Circle the isosceles triangle and give a reason for your identification

↳ 2 sides lengths and equal and the base angles are equal.



6. Calculate angle x.



Angles in triangle add to 180

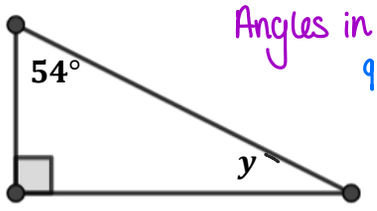
$x + 43 + 61 = 180$

$x + 104 = 180$

-104

$x = 76$

7. Calculate angle y in the right-angled triangle.



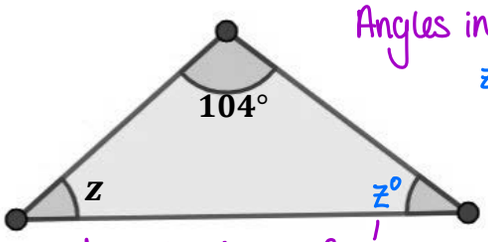
Angles in triangle add to 180

$90 + 54 + y = 180$

$144 + y = 180$

$y = 36$

8. The triangle below is an isosceles triangle. Calculate angle z.



Angles in triangle add to 180

$z + z + 104 = 180$

collect

$2z + 104 = 180$

-104

$2z = 76$

$\div 2$

$z = 38$

Isosceles Triangle - Base angles equal