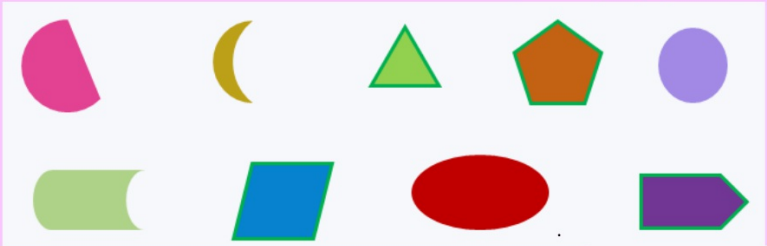
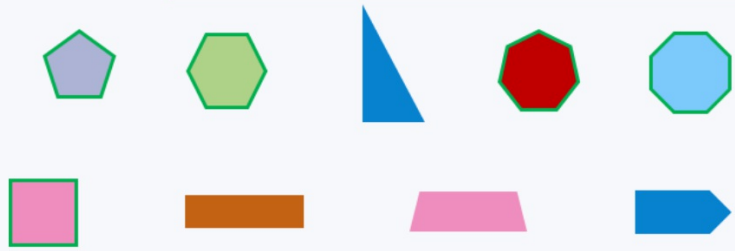
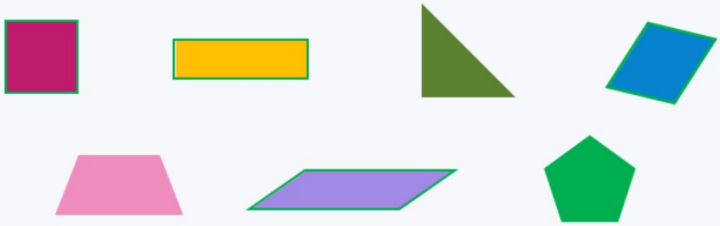
Warm-up



How many of these 2D shapes are polygons?

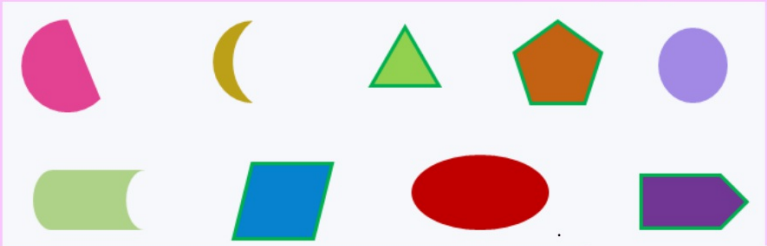
How many of these 2D shapes are regular polygons?





How many of these 2D shapes are parallelograms?

Warm-up

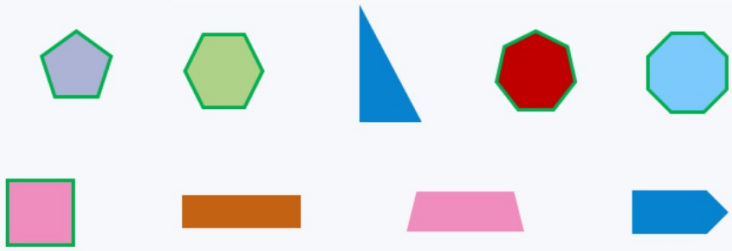


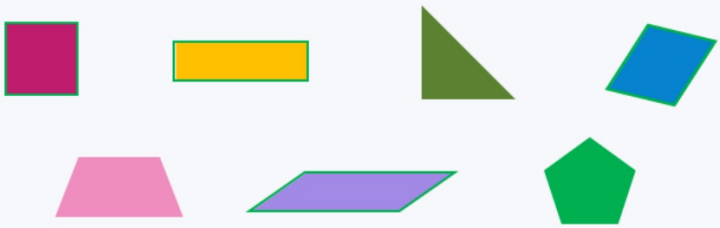
How many of these 2D shapes are polygons?

4

How many of these 2D shapes are regular polygons?

5





How many of these 2D shapes are parallelograms?

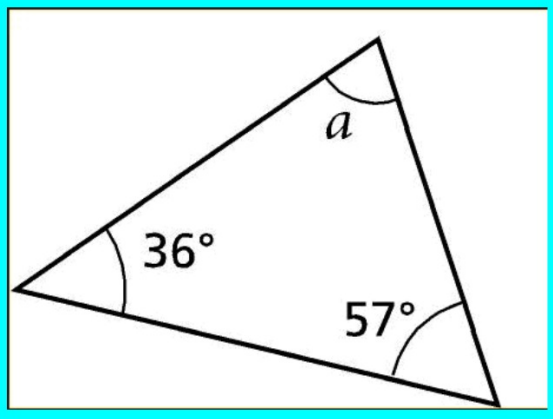
4

Can I find unknown angles in triangles and quadrilaterals?

Angles in a triangle =

Can I find unknown angles in triangles and quadrilaterals?

Using this knowledge, how do I work out the missing values?

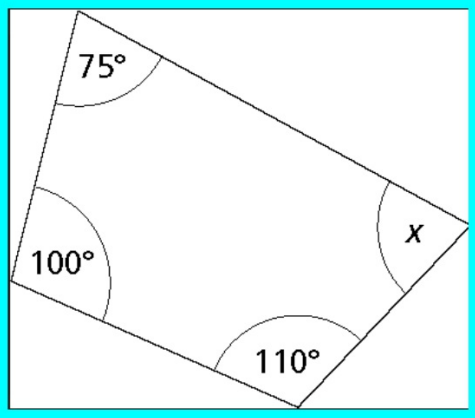


Can I find unknown angles in triangles and quadrilaterals?

Angles in a quadrilateral =

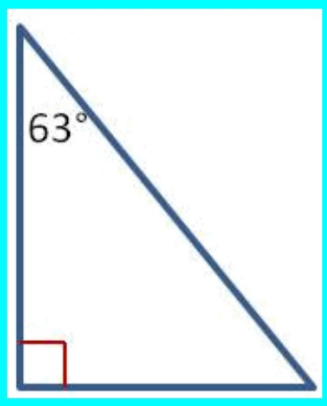
Can I find unknown angles in triangles and quadrilaterals?

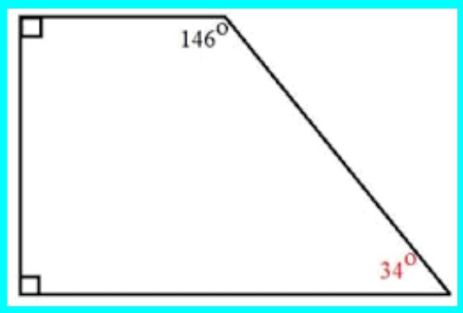
Using this knowledge, how do I work out the missing values?



Can I find unknown angles in triangles and quadrilaterals?

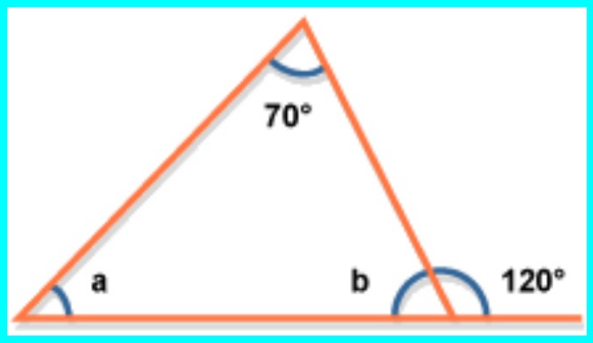
You might be given other information that can help you:





Can I find unknown angles in triangles and quadrilaterals?

Finding it easy? Then you will come across similar shapes to this one:



Can I find unknown angles in triangles and quadrilaterals?

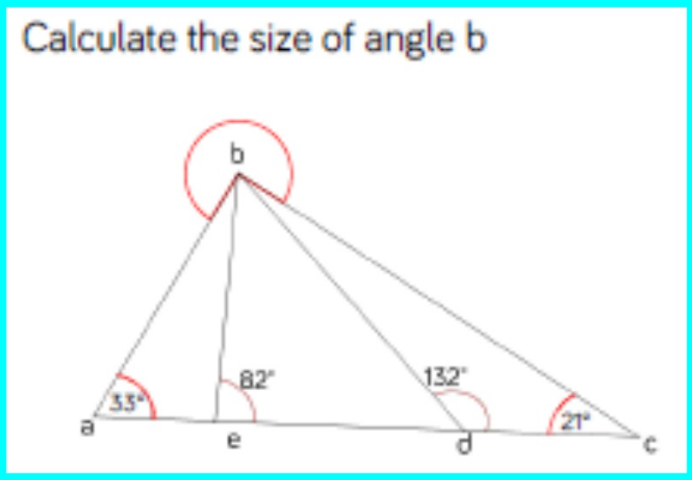
Walk

Run

Sprint

Can I find unknown angles in triangles and quadrilaterals?

Calculate the size of angle b



Warm-up

1. How many more sides does a hexagon have than a rhombus?
2. How many more sides does a nonagon have than a pentagon?
3. How many fewer sides does a trapezium have than a decagon?
4. How many sides are there altogether in a parallelogram, triangle and heptagon?
5. How many sides are there altogether in a kite, octagon and hexagon?

Warm-up

1. How many more sides does a hexagon have than a rhombus? 2

2. How many more sides does a nonagon have than a pentagon? 4

3. How many fewer sides does a trapezium have than a decagon? 6

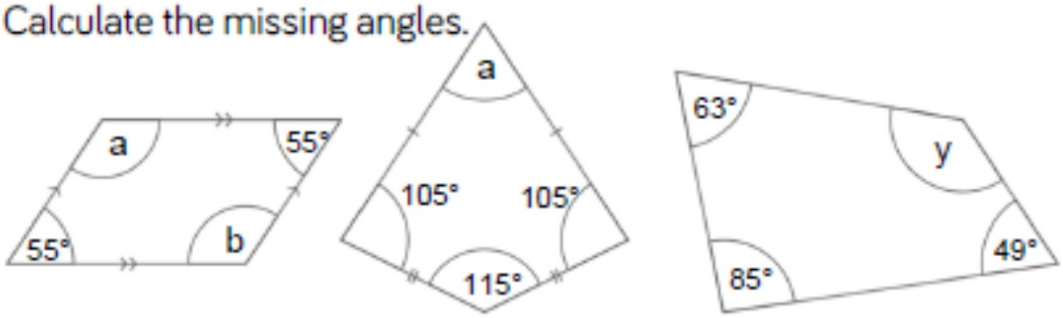
4. How many sides are there altogether in a parallelogram, triangle and heptagon? 14

5. How many sides are there altogether in a kite, octagon and hexagon? 18

Can I find unknown angles in triangles and quadrilaterals?

Calculate the missing angles.

Calculate the missing angles.

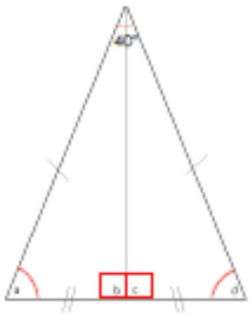


Can I find unknown angles in triangles and quadrilaterals?

I have an isosceles triangle.
One angle measures 42 degrees.

What could the other angles measure?

How many sentences can you write to express the relationships between the angles in the triangles?
One has been done for you.



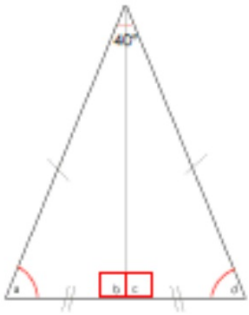
$40° + a + d = 180°$

I have an isosceles triangle.
One angle measures 42 degrees.

What could the other angles measure?

The angles could be:
42°, 42°, 96°
or
42°, 69°, 69°

How many sentences can you write to express the relationships between the angles in the triangles?
One has been done for you.

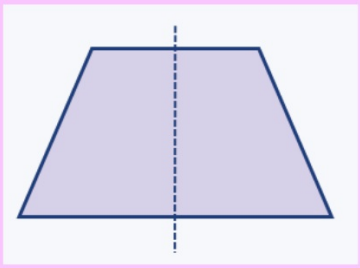


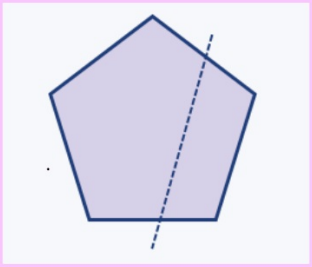
Possible responses:
$20° + a + b = 180°$
$20° + c + d = 180°$
$b = 90°$
$c = 90°$
$b = c$
$a = d$

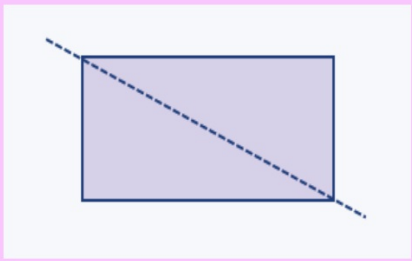
etc.

Children could also work out the value of each angle.

Warm-up

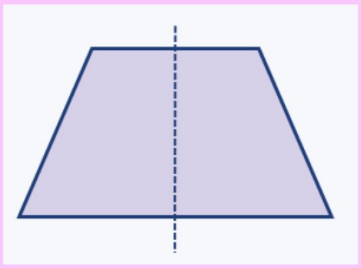


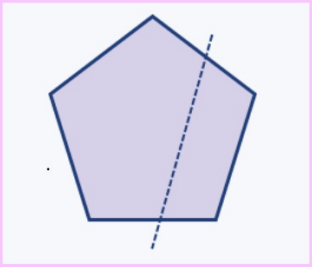


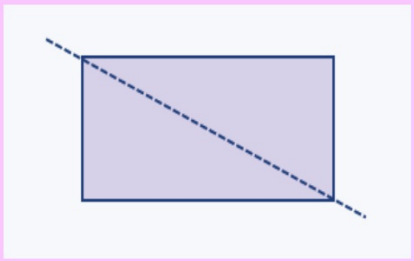


Do any of these show a line of symmetry?

Warm-up







Do any of these show a line of symmetry?

Yes

No

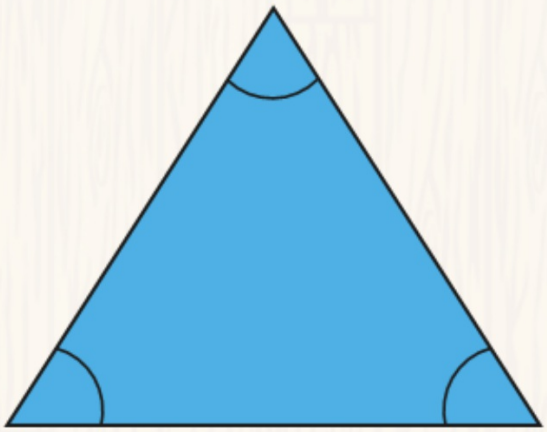
No

Can I find angles in regular polygons?

What Is an Interior Angle?

An interior angle is the angle made between
2 adjacent sides in any 2D shape.

This triangle has
3 interior angles.

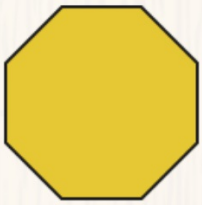


Can I find angles in regular polygons?

Regular Shapes

The interior angles of regular shapes are always equal.

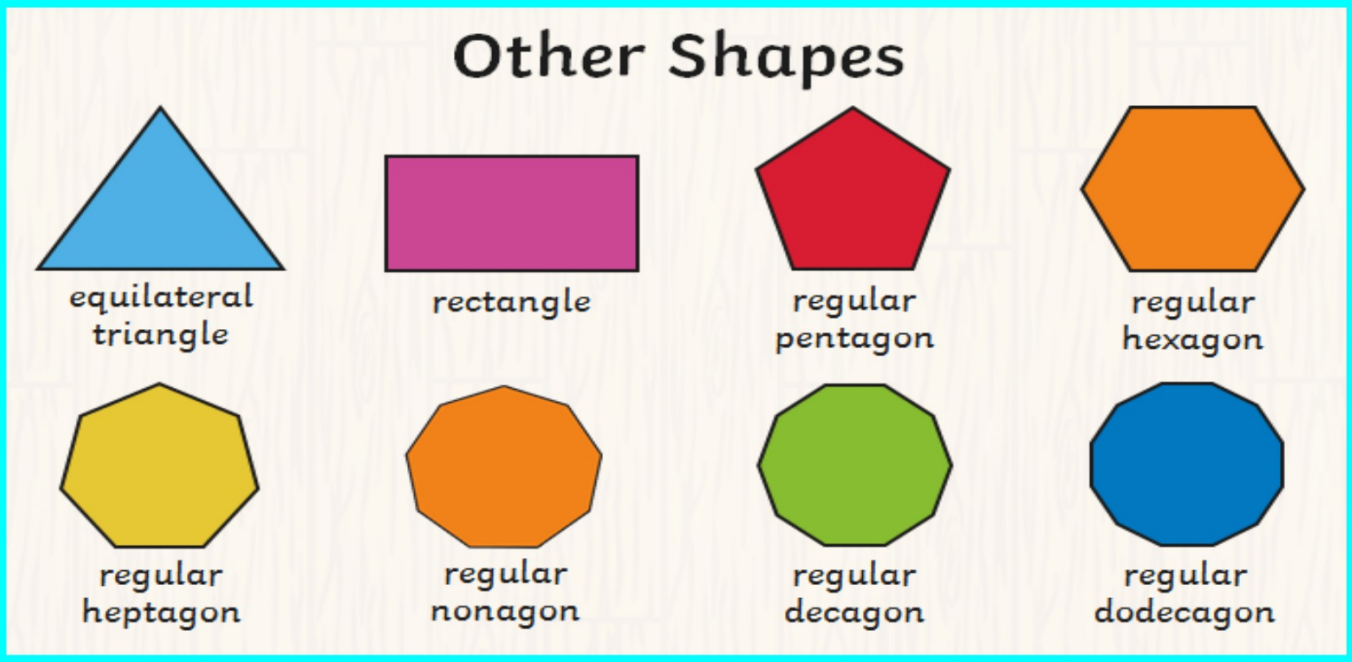
A square has 4 equal interior angles.



An octagon has 8 equal interior angles.

What other shapes have equal interior angles?

Can I find angles in regular polygons?



Can I find angles in regular polygons?

Shape	Number of angles	Interior Angle	Total of all interior angles
Equilateral triangle	3	60°	180°

Can I find angles in regular polygons?

Shape	Number of angles	Interior Angle	Total of all interior angles
Equilateral triangle	3	60°	180°

Challenges - you can pick one to complete:

Write a formula for working out the total of the interior angles / an interior angle for any polygon with n number of sides.

What is the interior angle for regular polygons with 15, 20, 30, 60 and 100 sides?

Can I find angles in regular polygons?

Shape	Number of angles	Interior Angle	Total of all interior angles
Equilateral triangle	3	60°	180°

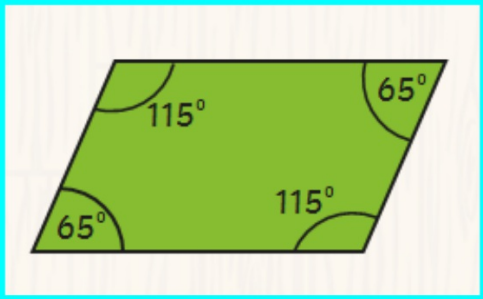
Write a formula for working out the total of the interior angles / an interior angle for any polygon with n number of sides.

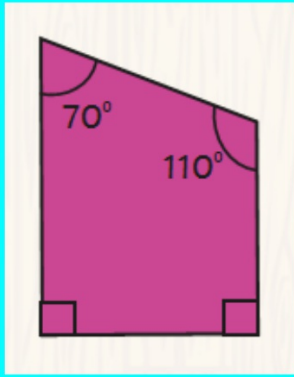
Total of interior angle = (number of sides - 2) x 180

What is the interior angle for regular polygons with 15, 20, 30, 60 and 100 sides?

156°, 162°, 168°, 174°, 176.4°

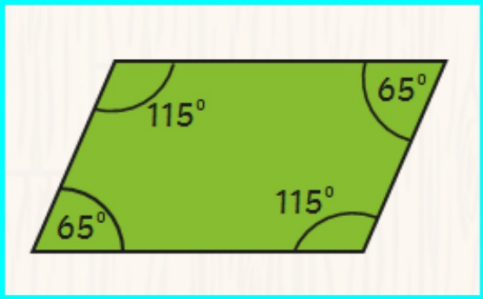
Can I find angles in regular polygons?





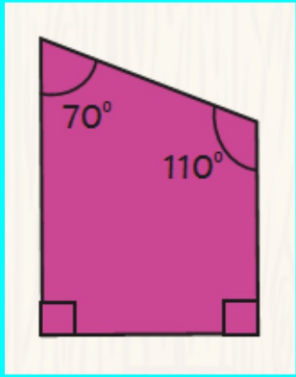
What do you notice about angles in these shapes and how can you use this knowledge to work out any missing angles?

Can I find angles in regular polygons?



Diagonally opposite angles are equal in a parallelogram.

Adjacent angles in a parallelogram add up to 180°.



In this trapezium, the angles at the bottom of the shape are right angles, so the other 2 angles add up to 180°.

Warm-up

Complete the carroll diagram for the shapes below:

	Has at least one right angle	Has no right angles
Has more than 3 sides		
Has less than 4 sides		

Ext: where could an isosceles triangle go?

Warm-up

Complete the carroll diagram for the shapes below:

	Has at least one right angle	Has no right angles
Has more than 3 sides		
Has less than 4 sides		

Ext: where could an isosceles triangle go?

less than four sides but either one right angle or no right angles because you can have a right-angled isosceles triangle

Five equal angles all meet around a point.
What is the size of each angle?
Explain how you know.

Four angles lie on a straight line.
One angle is 81 degrees.
The other three angles are equal.
What size are the other three angles?

Can I find missing angles?

Angles in a triangle:

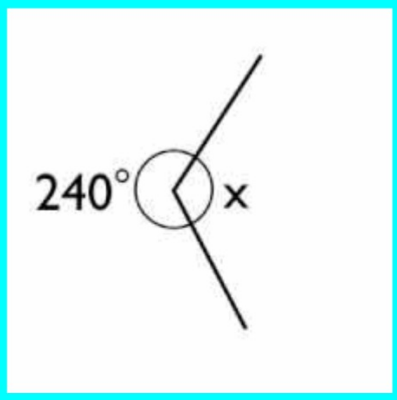
Angles in a quadrilateral:

Angles around a point:

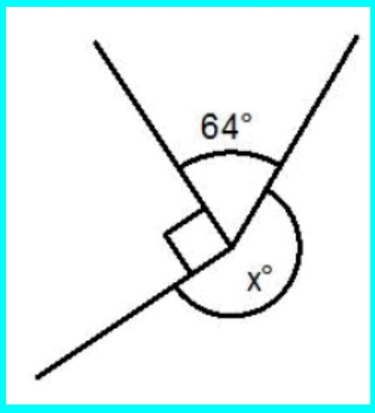
Angles on a straight line:

Vertically opposite angles

Can I find missing angles?



Can I find missing angles?



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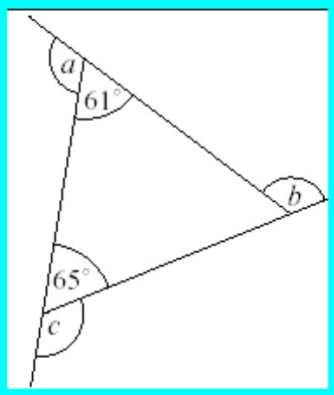
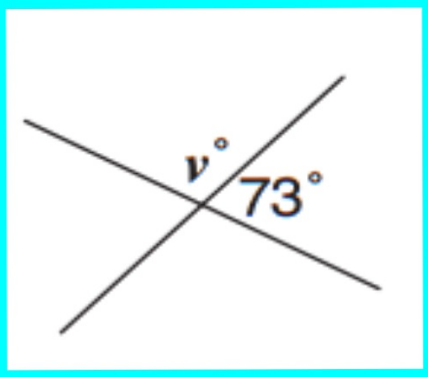


Can I find missing angles?



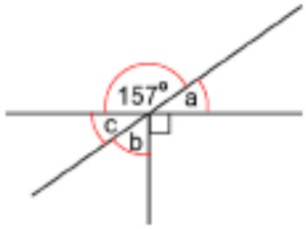
Can I find missing angles?

Walk

Run

Sprint

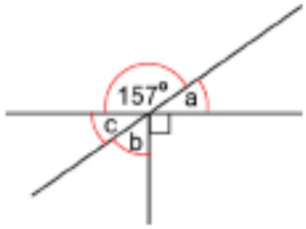
Can I find missing angles?



Rachel says that it's not possible to calculate all of the missing angles.

Do you agree? Explain why.

Can I find missing angles?



Rachel says that it's not possible to calculate all of the missing angles.

Do you agree? Explain why.

I disagree because:
180 − 157 = 23
so a = 23°
because angles on a straight line add up to 180°
Angles a and c are equal because they are vertically opposite so
c = 23°
Then angles around a point add up to 360° so
b = 67°

Can I find missing angles?

Darren says that angle g is equal to 30° because vertically opposite angles are equal.

Do you agree? Explain your answer.
If you disagree, work out the value of g.

Can I find missing angles?

Darren says that angle g is equal to 30° because vertically opposite angles are equal.

Do you agree? Explain your answer.
If you disagree, work out the value of g.

Darren is wrong because g is vertically opposite to e, not to 30° so g would actually be 60°