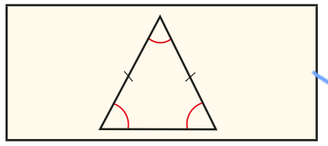
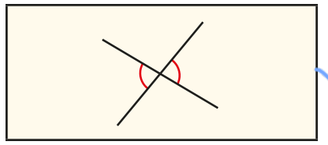
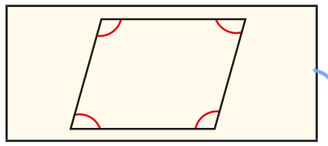
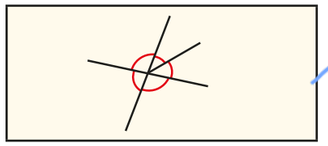
Solve angle problems using properties of triangles and quadrilaterals

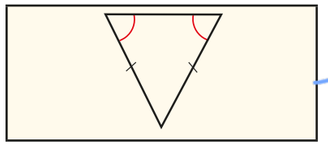
1 Match each diagram to the correct rule.

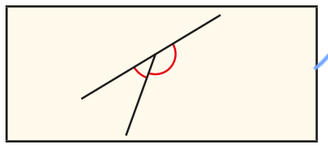












Angles on a straight line sum to 180°

Angles around a point sum to 360°

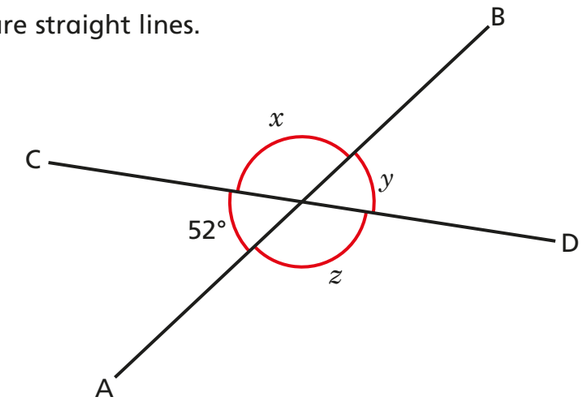
Angles in a triangle sum to 180°

In an isosceles triangle, two angles are equal

Vertically opposite angles are equal

Angles in a quadrilateral sum to 360

2 AB and CD are straight lines.



Work out the sizes of angles x, y and z. Give reasons for your answers.

x = 128° because angles on a straight line sum to 180°

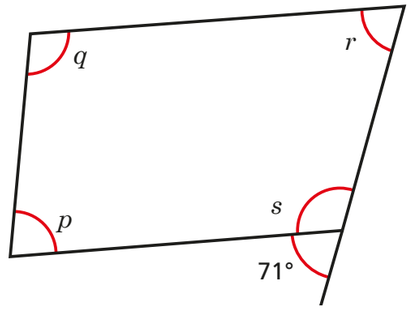
y = 52° because vertically opposite angles are equal.

z = 128° because vertically opposite angles are equal.

Compare your reasons with a partner.

Did you work out each angle in the same way?

3 Here is a quadrilateral.



a) Work out the size of angle s. Give a reason for your answer.

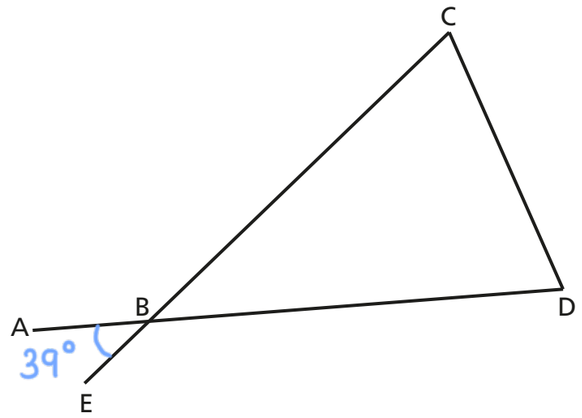
s = 109° because angles on a straight line sum to 180°

b) What is the sum of angles q, r and p? 251°

How do you know?

Angles in a quadrilateral sum to 360°

4 Here is a quadrilateral.



a) Angle ABE is 39°.

Label it on the diagram.

b) What is the size of angle ABC?

141°

How do you know?

Angles on a straight line sum to 180°

c) What is the size of angle CBD?

39°

How do you know?

Vertically opposite angles are equal.

d) What is the sum of angles BCD and CDB?

141°

How do you know?

Angles in a triangle sum to 180°

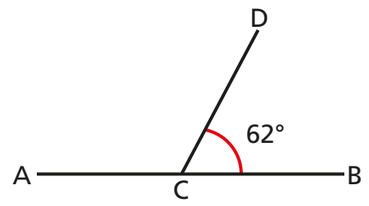
e) Angle BCD is 70°. Is triangle ACD isosceles? No

Discuss with a partner.

5 Complete the sentence for each diagram.

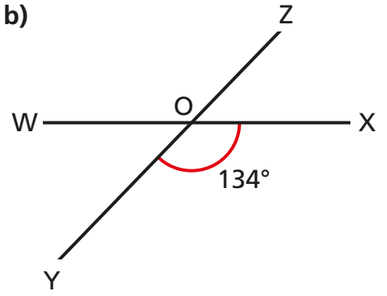
You must use correct mathematical vocabulary.

a)



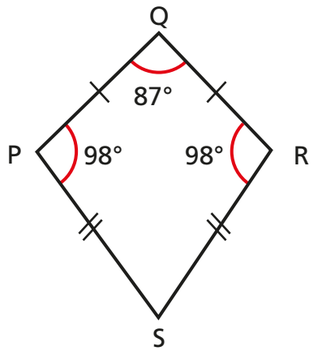
Angle ACD is 118° because angles on a straight line sum to 180°

b)



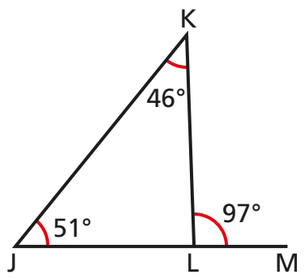
Angle WOZ is 134° because vertically opposite angles are equal.

c)



Angle PSR is 77° because angles in a quadrilateral sum to 360°

d)



Angle JLK is 83° because angles on a straight line sum to 180° or angles in a triangle sum to 180°