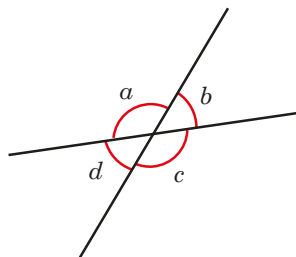


Vertically opposite angles

1 The diagram shows four angles formed by two straight lines.



a) Measure the sizes of the angles.

$a = 130^\circ$ $b = 50^\circ$ $c = 130^\circ$ $d = 50^\circ$

b) What is the total of angles a and b ?

180°

Explain why.

Adjacent angles on a straight line sum to 180°

Do any other pairs of angles have this same total?

c) Angles a and c are vertically opposite angles.

What do you notice about the sizes of angles a and c ?

They are equal.

d) Angles b and d are also vertically opposite angles.

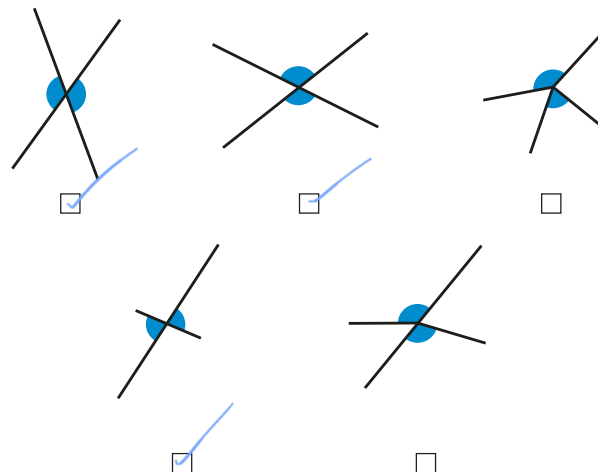
What do you notice about the sizes of angles b and d ?

They are equal.

e) Complete the sentence.

Vertically opposite angles are equal.

2 Tick the pairs of angles that are vertically opposite.

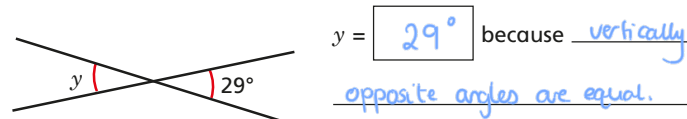


Compare answers with a partner.

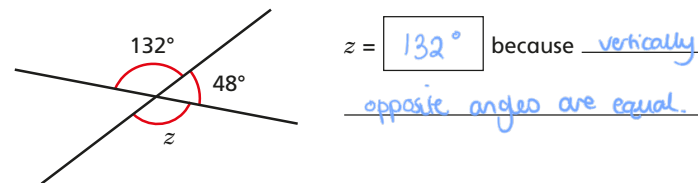
3 Work out the sizes of the unknown angles.

Give reasons for your answers.

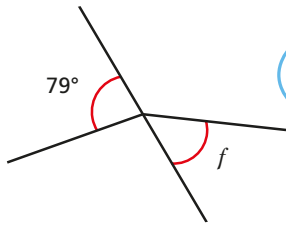
a)



b)



- 4 Annie is working out the size of angle f .



Angle f is equal to 79° because vertically opposite angles are equal.

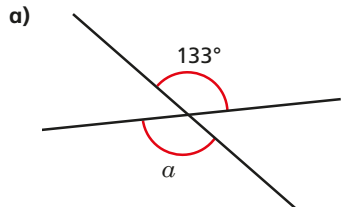


Do you agree with Annie? No

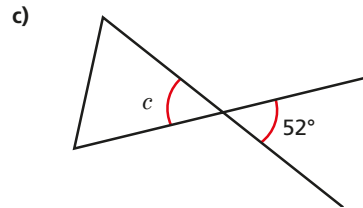
Explain your answer.

The diagram doesn't show two straight lines crossing so the angles are not vertically opposite.

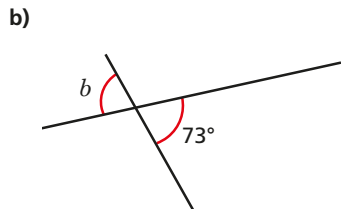
- 5 Work out the unknown angles.



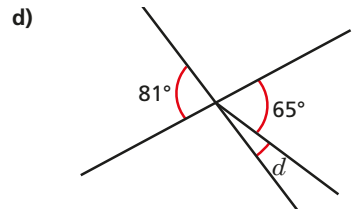
$a = 133^\circ$



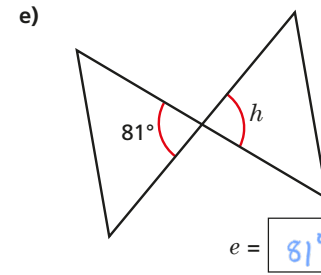
$c = 52^\circ$



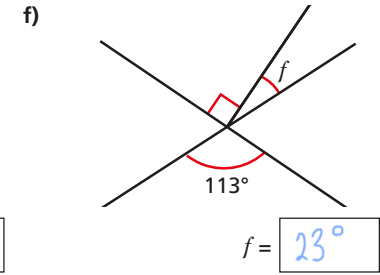
$b = 73^\circ$



$d = 16^\circ$



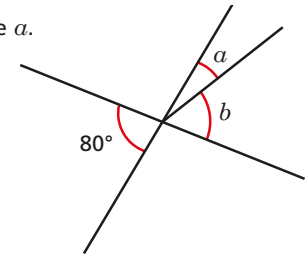
$e = 81^\circ$



$f = 113^\circ$

Talk about your reasons with a partner.

- 6 Angle b is three times the size of angle a .

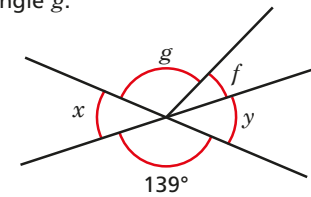


Work out the sizes of angles a and b .

$a = 20^\circ$ $b = 60^\circ$

- 7 Angle f is one quarter of the size of angle g .

Angle f is 28° .



Are angles x and y vertically opposite? No

Explain your answer.

$28 \times 4 = 112$ so $g = 112^\circ$
 $112 + 28 = 140$

$139 \neq 140$ therefore the diagram does not show vertically opposite angles.