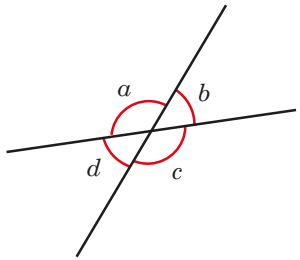
Vertically opposite angles

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



a) Measure the sizes of the angles.

$a =$ ☐ $b =$ ☐ $c =$ ☐ $d =$ ☐

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

Explain why.

_____

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?

_____

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

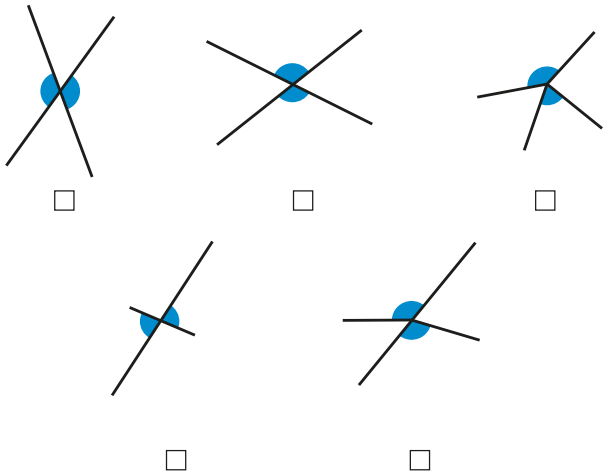
What do you notice about the sizes of angles b and d?

_____

e) Complete the sentence.

Vertically opposite angles _____

2 Tick the pairs of angles that are vertically opposite.



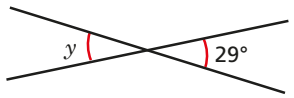
☐ ☐ ☐ ☐ ☐

Compare answers with a partner.

3 Work out the sizes of the unknown angles.

Give reasons for your answers.

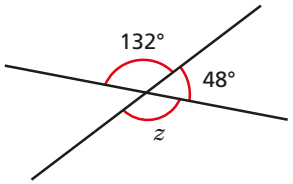
a)



$y =$ ☐ because _____

_____

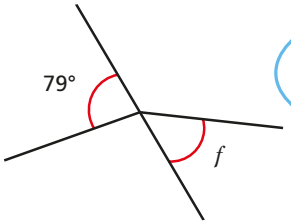
b)

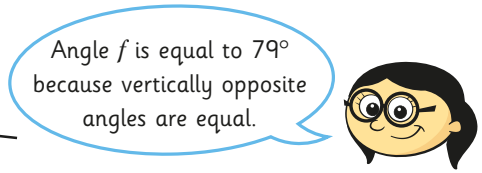


$z =$ ☐ because _____

_____

4 Annie is working out the size of angle f.





Do you agree with Annie? _____

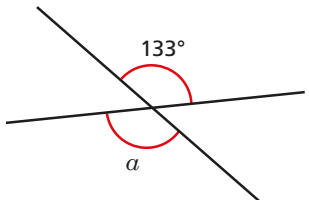
Explain your answer.

_____

_____

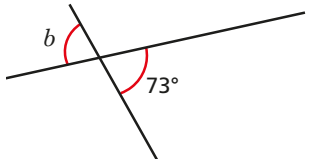
5 Work out the unknown angles.

a)



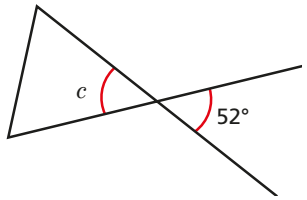
a = ☐

b)



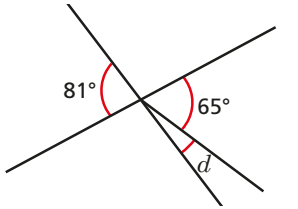
b = ☐

c)



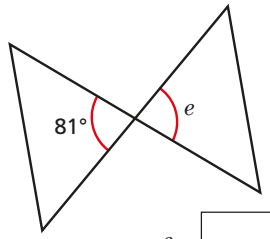
c = ☐

d)



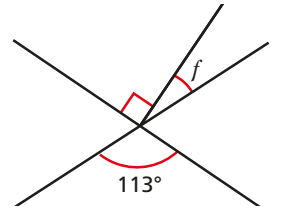
d = ☐

e)



e = ☐

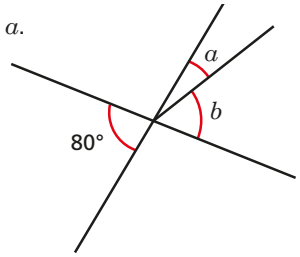
f)



f = ☐

Talk about your reasons with a partner.

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

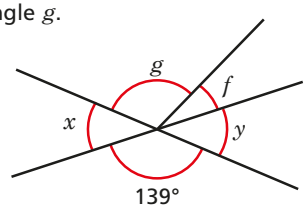


Work out the sizes of angles a and b.

a = ☐ b = ☐

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

Angle f is 28°.



Are angles x and y vertically opposite? _____

Explain your answer.

_____

_____