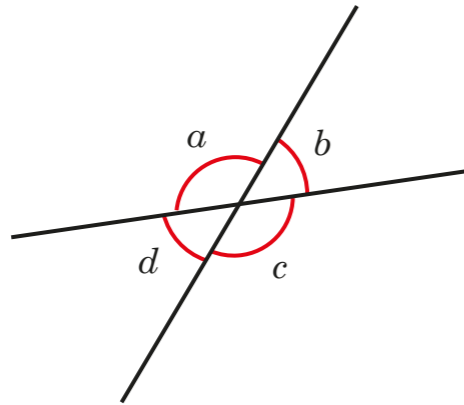# Understand and use the equality of vertically opposite angles

1 The diagram shows four angles around a point.

a) What is the sum of all four angles? **360°**

   How do you know?

b) Which pairs of angles sum to 180°?

   a & b,   a & d, b & c, c & d

   How do you know?

c) Which pairs of angles are equal?

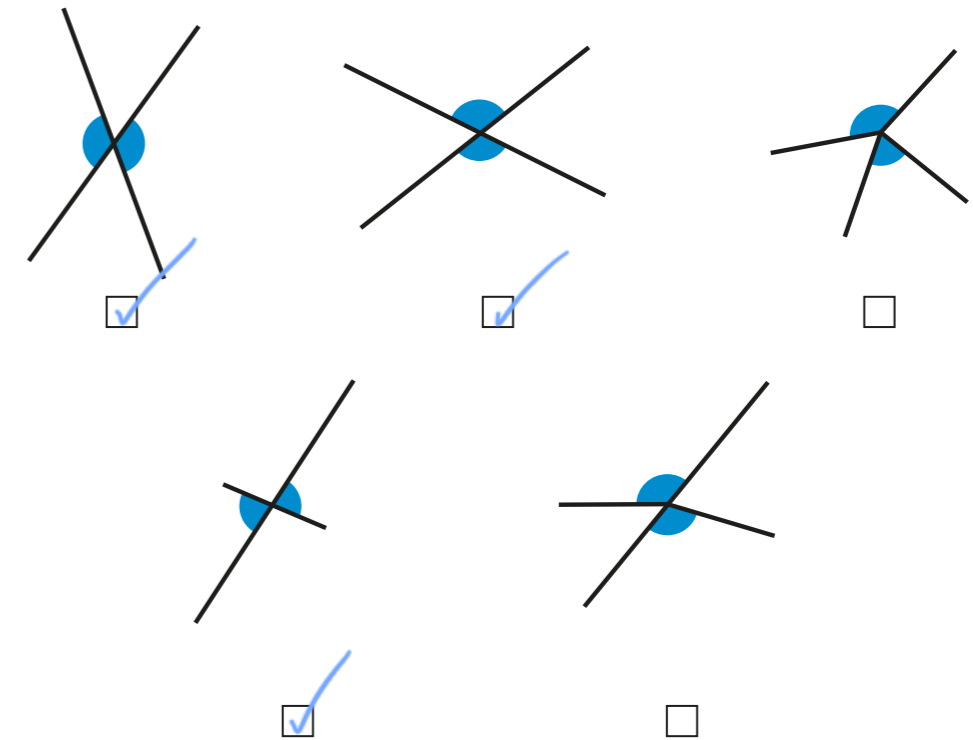   *a & c,   b & d*

   How do you know?

d) Complete the sentences.

   Angles round a point _sum to 360°_

   Adjacent angles on a straight line _Sum to 180°_
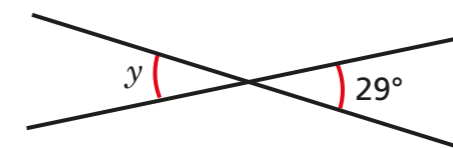
   Vertically opposite angles _are equal._

2 Tick the pairs of angles that are vertically opposite.

☑   ☑   ☐
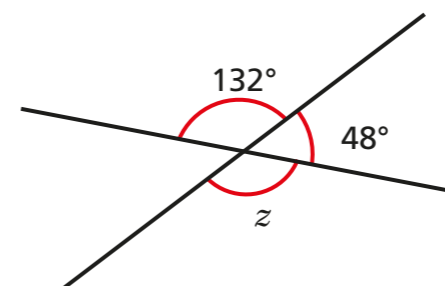
☑   ☐

Compare answers with a partner.

3 Work out the sizes of the unknown angles.
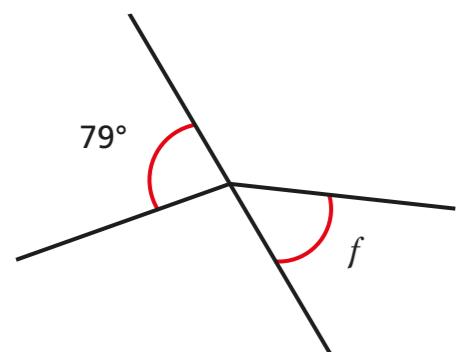
   Give reasons for your answers.

a)

$y =$ **29°** because _vertically opposite angles are equal._

b)

$z =$ **132°** because _vertically opposite angles are equal_

4 Whitney is working out the size of angle f.

79°

f

Angle f is equal to 79° because vertically opposite angles are equal.
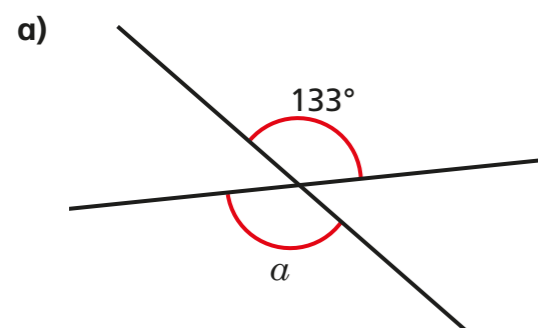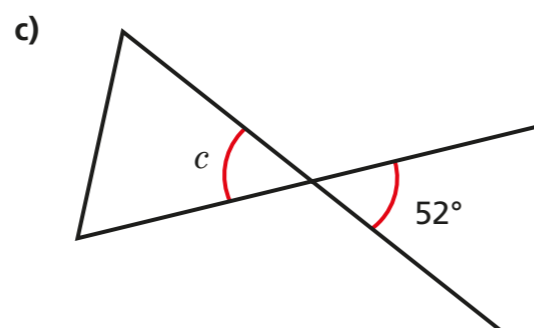
Do you agree with Whitney? __No__

Explain your answer.

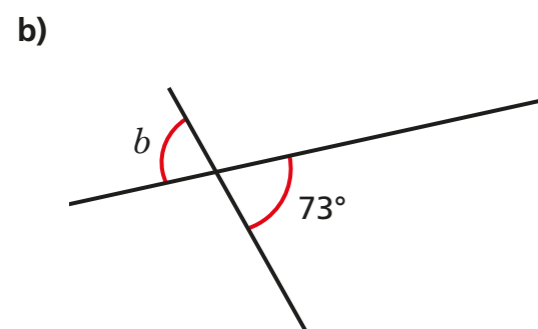__The lines aren't straight so the angles are not__
__vertically opposite.__
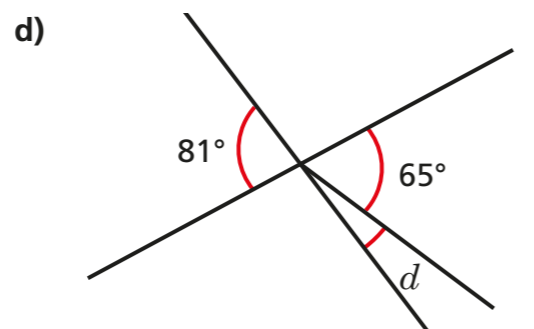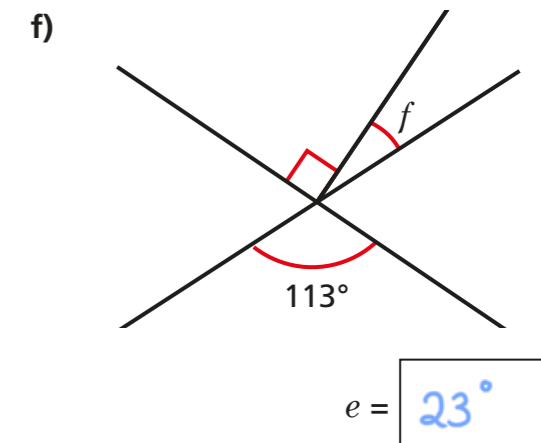
5 Work out the unknown angles.

a)

133°

a

$a = $ __133°__

b)

b

73°

$b = $ __73°__

c)

c

52°

$c = $ __52°__

d)

81°

65°

d

$d = $ __16°__

e)

81°

e

$e = $ __81°__

f)

f

113°

$e = $ __23°__
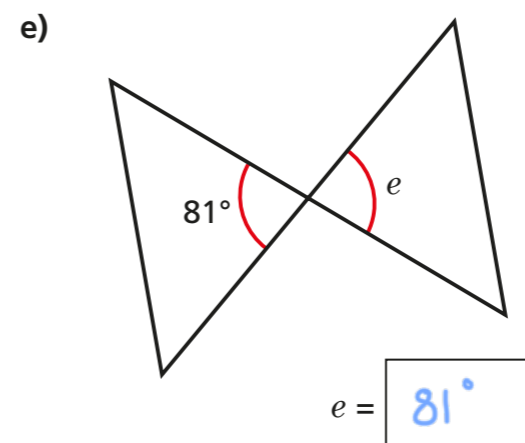
Talk about your reasons with a partner.

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

a

b

80°
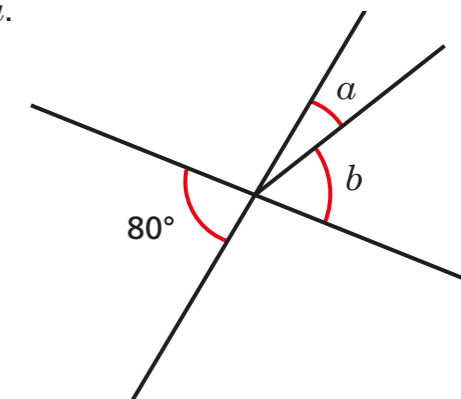
Work out the sizes of angles a and b.

$a = $ __20°__

$b = $ __60°__

7 The diagram shows three straight lines intersecting at a single point.

Work out the value of x and y.

46°

63°

$5x-7$

y

$x = $ __14°__

$y = $ __71°__

White Rose Maths