

Finding angles

Starter

1. (Review of last lesson)

Make x the subject: (a) $a(x + c) = x - 7$ (b) $y = \frac{x(4 + y)}{a + x}$

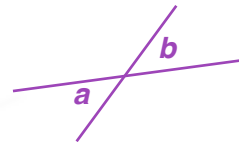
Working: (a) $a(x + c) = x - 7$ $x = \frac{ca + 7}{1 - a}$

(b) $y = \frac{x(4 + y)}{a + x}$

2. (Review of previous material) Add a short phrase to complete each angle fact.

- (a) Angles on a straight line _____.
- (b) Angles at a point _____.
- (c) Vertically opposite angles _____.
- (d) Angles in a triangle _____.
- (e) Equilateral triangles _____.
- (f) Isosceles triangle _____.
- (g) Angles in a quadrilateral _____.

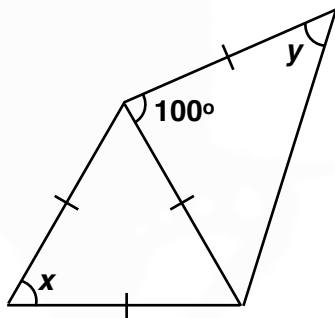
Vertically opposite angles



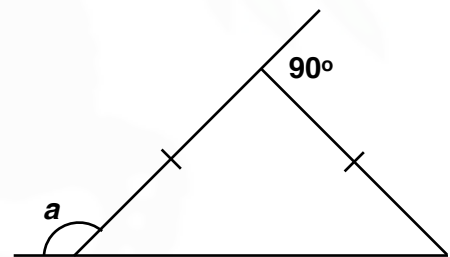
- Working:**
- (a) Angles on a straight line...add up to 180° .
 - (b) Angles at a point...add up to 360° .
 - (c) Vertically opposite angles...are equal.
 - (d) Angles in a triangle...add up to 180° .
 - (e) Equilateral triangles...have three equal angles of 60° .
 - (f) Isosceles triangle...one pair of equal angles.
 - (g) Angles in a quadrilateral...add up to 180° .

E.g. 1 Calculate the values of the marked angles:

(a)



(b)



- Working:** (a) Angle x is an equilateral triangle so $x = 60^\circ$
 Angle y is in an isosceles triangle so $y = \frac{180^\circ - 100^\circ}{2} = 40^\circ$

- (b) The angle at the top of the isosceles triangle is 90° .
 The identical angles in the isosceles triangle are $\frac{180^\circ - 90^\circ}{2} = 45^\circ$
 $a = 180^\circ - 45^\circ - 135^\circ$

Some questions may require you to set up and solve a linear equation.

E.g. 2 Calculate the values of p and q .

Working: *Since the triangle including angle p is isosceles the angles are p , $2p$ and $2p$.*

$$\therefore p + 2p + 2p = 180^\circ$$

$$5p = 180^\circ$$

$$p = 36^\circ$$

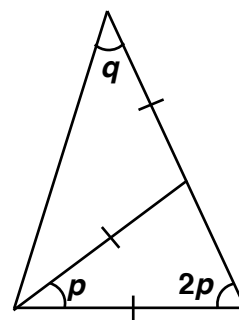
The triangle including q is also isosceles.

The angles are q , q and $180^\circ - 2p = 108^\circ$

$$\therefore q + q + 108^\circ = 180^\circ$$

$$2q = 72^\circ$$

$$q = 36^\circ$$



Video: [Angles in a triangle](#)

[Solutions to Starter and E.g.s](#)

Exercise

9-1 class textbook:

p62 M3.1 Qu 1-24 odd Draw all diagrams

A*-G class textbook:

p55 M3.1 Qu 1-24 odd Draw all diagrams.

9-1 homework book:

p19 M3.1 Qu 1-10 Draw all diagrams

A*-G homework book:

p14 M3.1 Qu 1-10 Draw all diagrams