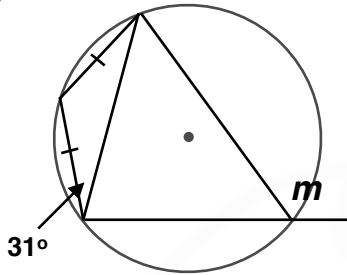


Tangents to Circles

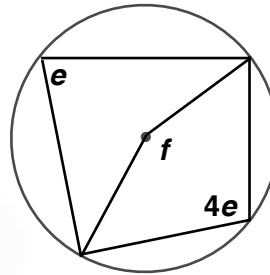
Starter

1. (Review of last lesson) Find the marked angles, giving reasons for your answers:

(a)



(b)



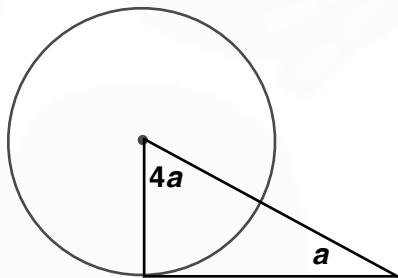
Working:

(a) In the isosceles triangle, the obtuse angle = $180 - 2 \times 31 = 118^\circ$
 $\therefore m = 118^\circ$ because the exterior angle of a cyclic quadrilateral equals the opposite interior angle.

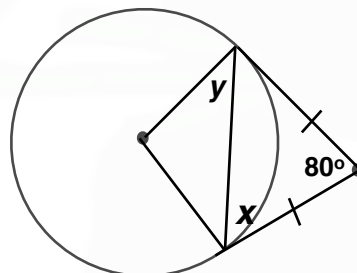
(b) $e + 4e = 180$ because opposite angles in a cyclic quadrilateral add up to 180° .
 $5e = 180 \Rightarrow e = 36^\circ$
 $f = 2e = 2 \times 36 = 72^\circ$ because the angle at the centre is twice the angle at the circumference from the same chord.

E.g. 1 Find the marked angles or lengths.

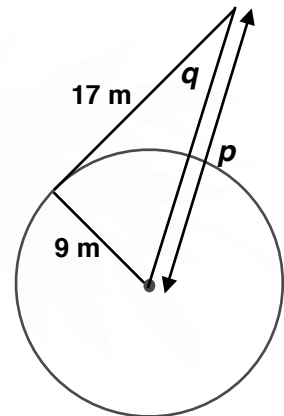
(a)



(b)



(c)



Working:

(a) The angle between a radius and a tangent is 90° so $4a + a = 90$
 $5a = 90 \Rightarrow a = 18^\circ$

(b) Isosceles triangle so $x = \frac{180 - 80}{2} = 50^\circ$
 The angle next to y is also 50°
 The angle between a radius and a tangent is 90° so $y + 50 = 90$
 $y = 40^\circ$

(c) The triangle is right-angled so by Pythagoras: $p^2 = 9^2 + 17^2$
 $p = \sqrt{370} = 19.2 \text{ m}$

Using trigonometry: $\tan q = \frac{9}{17}$
 $\therefore q = \tan^{-1}\left(\frac{9}{17}\right) = 27.9^\circ$

Exercise

9-1 class textbook:	p79 E3.3 Qu 1-12 odd, 13-21
A*-G class textbook:	p72 E3.3 Qu 1-11 odd, 12-19
9-1 homework book:	p27 E3.3 Qu 1-8
A*-G homework book:	p21 E3.3 Qu 1-8

[Homework book answers \(only available during a lockdown\)](#)

