

Lesson 3

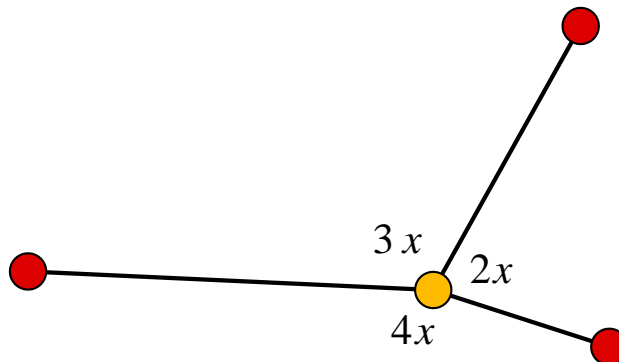
GCSE Mathematics Angles & Polygons

3.1 Around A Point



Boston Harbour Lighthouse from a postcard dated 1909

The beam of light from a lighthouse sweeps through a circle of 360° repeatedly. As it does so we can imagine it illuminating three nearby ships. Here is a diagram of the situation from above; a night owl's view !



The yellow spot is the lighthouse, the red spots the three ships

The ratio of the sizes of the angles between the three ships are known, they are

$$2 : 3 : 4$$

The puzzle now is to find the size of each of the three angles. Can you do it ?

Have a go in the space below.



[3 marks]

Now check your solution with mine which is on the next page.

The Solution : The three angles have to add up to 360°

$$2x + 3x + 4x = 360$$

$$9x = 360$$

$$x = \frac{360}{9}$$

$$= 40^\circ$$

\therefore The three angles are 80° , 120° and 160°

[3 marks]

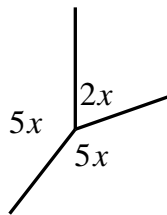
3.2 Mini Exercise

Give the following three questions a go.

Question 1

Find the size of each of the three angles in the diagram

Hint : • Angles about a point sum to 360°

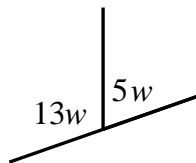


[3 marks]

Question 2

Find the size of each of the two angles in the diagram

Hint : • Angles about a line sum to 180°

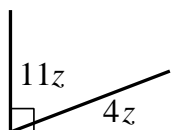


[3 marks]

Question 3

Find the size of each of the two angles in the diagram

Hint : • Angles within a Right-Angle sum to 90°



[3 marks]

3.3 Answers to the Mini Exercise

Answer 1

$$2x + 5x + 5x = 360$$

$$12x = 360$$

$$x = \frac{360}{12}$$

$$= 30$$

∴ The three angles are 60° , 150° and 150°

[3 marks]

Answer 2

$$13w + 5w = 180$$

$$18w = 180$$

$$w = \frac{180}{18}$$

$$w = 10$$

∴ The two angles are 50° and 130°

[3 marks]

Answer 3

$$4z + 11z = 90$$

$$15z = 90$$

$$z = \frac{90}{15}$$

$$= 6$$

∴ The two angles are 24° and 66°

[3 marks]

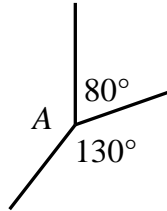


3.4 Exercise

You may use a calculator
Marks Available : 24

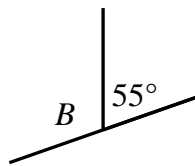
Question 1

(i) Find angle A



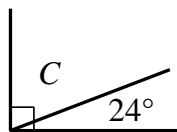
[2 marks]

(ii) Find angle B



[2 marks]

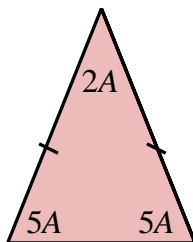
(iii) Find angle C



[2 marks]

Question 2

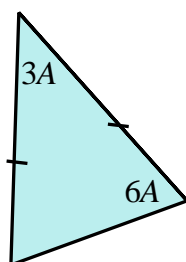
Determine the value of A , and hence **list the three angles** in this isosceles triangle



[4 marks]

Question 3

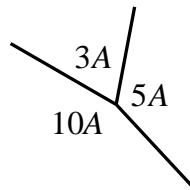
Determine the value of A , and hence **list the three angles** in this isosceles triangle



[4 marks]

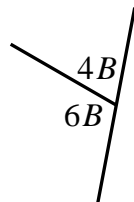
Question 4

- (i) Determine the value of A , and hence **list the three angles**



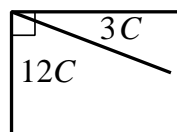
[4 marks]

- (ii) Determine the value of B , and hence **list the two angles**



[3 marks]

- (iii) Determine the value of C , and hence **list the two angles**.



[3 marks]