4.1 Ratio Polygons

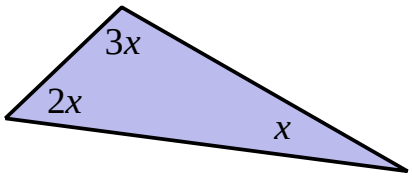
In much the same way as ratios of angles about a point, or a line, or a right angled corner where considered in lesson 3, polygons with interior angles in a given ratio will be studied in this lesson.

For example suppose that a triangle has interior angles in the ratio 1 : 2 : 3
Using the fact that

- Interior Angle Sum, *IAS*, for a triangle is 180°

list the three angles in the triangle

The Solution:



The three angles have to add up to 180°

$$x + 2x + 3x = 180$$
$$6x = 180$$
$$x = \frac{180}{6}$$
$$= 30°$$

$\therefore$ The three angles are 30°, 60° and 90°

[3 marks]

4.2 Now You Try

A quadrilateral has interior angles in the ratio 1 : 2 : 2 : 4
Using the fact that

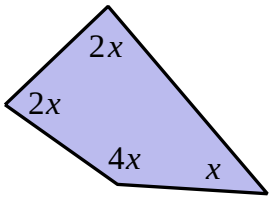
- Interior Angle Sum, IAS, for a quadrilateral is 360°

list the four angles in the quadrilateral

[4 marks]

4.3 The Now You Try Answer

The Solution :



The four angles have to add up to 360°

$$x + 2x + 2x + 4x = 360$$
$$9x = 360$$
$$x = \frac{360}{9}$$
$$= 40°$$

$\therefore$ The four angles are 40°, 80°, 80° and 160°

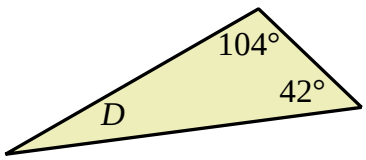
[4 marks]

4.4 Exercise

You may use a calculator
Marks Available : 45

Question 1

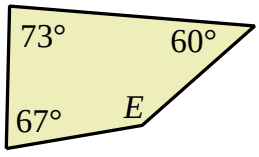
Find angle *D*



[2 marks]

Question 2

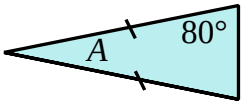
Find angle *E*



[2 marks]

Question 3

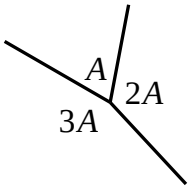
Find angle A in this isosceles triangle



[2 marks]

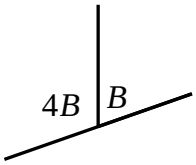
Question 4

(i) Find angle A



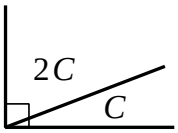
[3 marks]

(ii) Find angle B



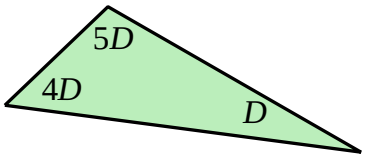
[3 marks]

(iii) Find angle C



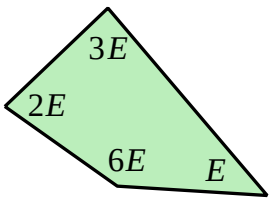
[3 marks]

(iv) Find angle D



[3 marks]

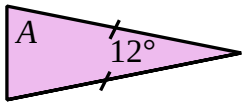
(v) Find angle E



[3 marks]

Question 5

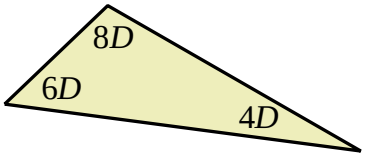
Find angle *A* in this isosceles triangle



[2 marks]

Question 6

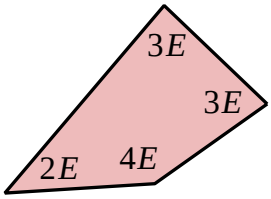
Determine the value of *D*, and hence **list the three angles**



[4 marks]

Question 7

Determine the value of *E*, and hence **list the four angles**



[4 marks]

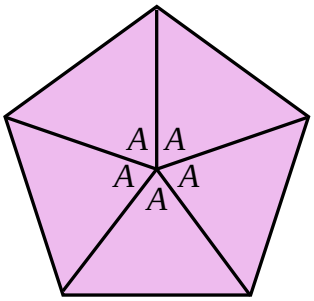
Question 8

A regular pentagon is shown

(i) What is the angle, *A*, between each spoke ?

[2 marks]

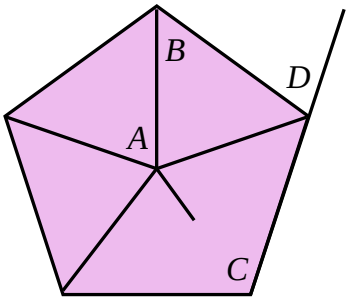
(ii) On the diagram shade in an isosceles triangle.



[1 mark]

Question 9

Determine angles *A, B, C* and *D* in the regular pentagon, shown below



[4 marks]

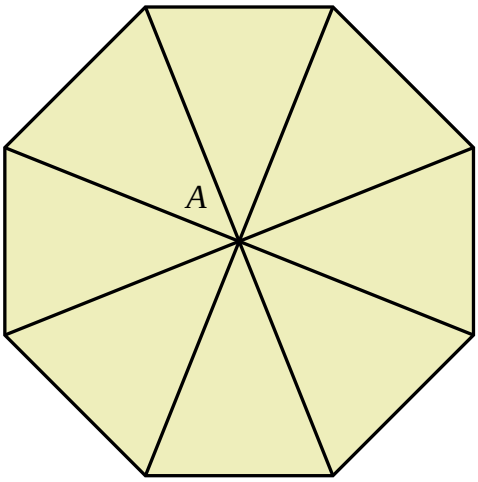
Question 10

A regular octagon is shown

(i) What is the angle, *A*, between each spoke ?

[2 marks]

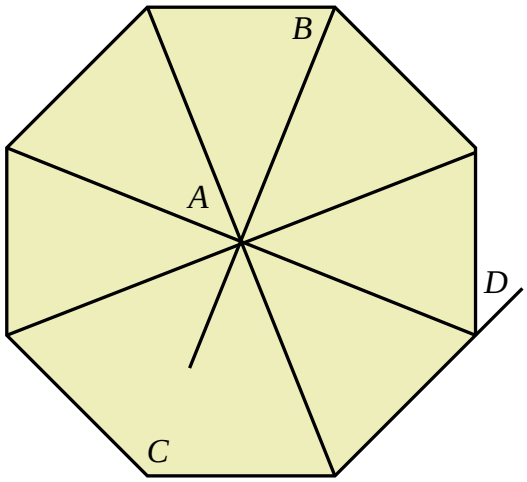
(ii) On the diagram shade in an isosceles triangle



[1 mark]

Question 11

Determine angles *A*, *B*, *C* and *D* in the regular octagon, shown below



[4 marks]