# Higher Check In - 10.05 Triangle mensuration

1. Calculate angle *x*, giving your answer to 3 significant figures.

195 m

158 m

*x*

1. Calculate angle *B*, giving your answer to 3 significant figures.

*B*

65°

*A*

5 cm

10 cm

*C*

1. Calculate length *EF*, giving your answer to 1 decimal place.

*E*

6 cm

35°

*F*

*D*

14 cm

1. Calculate length *GH*, giving your answer to 3 significant figures.

*H*

32°

*I*

*G*

94°

7 cm

1. Calculate angle *K*, giving your answer to 3 significant figures.

*K*

8.7 cm

9.2 cm

8.5 cm

*L*

*J*

1. Rakesh thinks that . Show that he is incorrect.
2. Mary says that you can calculate *x* using the cosine ratio, but Shah says that you can use the sine rule. Explain why both Mary and Shah are correct.

*x*

48°

8.7 cm

1. A square-based pyramid has its vertex vertically above the centre of the square (so it is called a right pyramid). If **all** the edges of the pyramid are 10 cm long, show that the angle between each face of the pyramid and the square base is 54.7°, correct to 1 decimal place.

10 cm

1. Find the angle between the lines *BD* and *DF*. Give your answer correct to 1 decimal place.

6 cm

*F*

*E*

2 cm

*C*

*B*

4 cm

*D*

*A*

1. A ship sails on a bearing of 052° for 60 km, then changes direction and sails on a bearing of 155° for another 80 km.

How far is the ship now from its starting point? Give your answer correct to 3 significant figures. (Hint: first draw a diagram.)

**Extension**

Each side of the regular octagon below measures 1 m.

Work out the area of the octagon. Give your answer correct to 3 significant figures.

1 m

Answers

1. 39.0°
2. 26.9°
3. 9.7 cm
4. 10.7 cm
5. 56.6°
6. ,  so 

But  so 

1. As the triangle has a right angle you can use the cosine ratio

This gives cm (3 sf)

You can also use the sine rule 

where angle , angle  and side cm

This gives  so cm (3 sf)

1. First, work out the distance *x* from the apex of the pyramid to the midpoint of each face.

5 cm

10 cm

**

Using Pythagoras’ theorem

 

 

**

5 cm

cm

Then 

And  (to 1 dp)

1.  (1 dp)
2. 88.5 km (3 sf)

**Extension**

Divide the octagon into 8 isosceles triangles.

The angle at the centre of each triangle is .

Divide each isosceles triangle into two congruent right-angled triangles.

0.5 m



22.5°

 so m.

The area of each isosceles triangle is given by  base × height

Therefore the area of each isosceles triangle m2

The total area of the octagon m2 (3 sf)

**

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| **Assessment Objective** | **Qu.** | **Topic** | **R** | **A** | **G** |  | **Assessment Objective** | **Qu.** | **Topic** | **R** | **A** | **G** |
| AO1 | 1 | Use trigonometry to find an angle |  |  |  |  | AO1 | 1 | Use trigonometry to find an angle |  |  |  |
| AO1 | 2 | Find an angle using the sine rule |  |  |  |  | AO1 | 2 | Find an angle using the sine rule |  |  |  |
| AO1 | 3 | Find a length using the cosine rule |  |  |  |  | AO1 | 3 | Find a length using the cosine rule |  |  |  |
| AO1 | 4 | Find a length using the sine rule |  |  |  |  | AO1 | 4 | Find a length using the sine rule |  |  |  |
| AO1 | 5 | Find an angle using the cosine rule |  |  |  |  | AO1 | 5 | Find an angle using the cosine rule |  |  |  |
| AO2 | 6 | Use exact value of trigonometric functions to prove a result |  |  |  |  | AO2 | 6 | Use exact value of trigonometric functions to prove a result |  |  |  |
| AO2 | 7 | Explain different methods of using trigonometry |  |  |  |  | AO2 | 7 | Explain different methods of using trigonometry |  |  |  |
| AO2 | 8 | Use trigonometry in 3D to prove a result |  |  |  |  | AO2 | 8 | Use trigonometry in 3D to prove a result |  |  |  |
| AO3 | 9 | Use Pythagoras’ theorem in 3D |  |  |  |  | AO3 | 9 | Use Pythagoras’ theorem in 3D |  |  |  |
| AO3 | 10 | Solve a real-life word problem involving bearings using the cosine rule |  |  |  |  | AO3 | 10 | Solve a real-life word problem involving bearings using the cosine rule |  |  |  |
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