# OCR 10 Mensuration (Higher)

1. Calculate the radius of a circle that has area km2.
2. Find the angle whose cosine is 0.8.
3. A skier weighs 750 N. His skis have a combined surface area of 0.25 m2.

How much pressure does the skier exert on the snow in N/m2?

1. Find the perimeter of this shape.

5 cm

**Not to scale**

10 cm

1. One face of a cube has area 200 cm2.What is the surface area of the whole cube in m2?
2. Sarah drives for 2 hours 20 minutes at an average speed of 42 miles per hour.

How far does she drive?

1. Calculate *L*.

36°

**Not to scale**

*L*

5.1 cm

1. A map has a scale of 1 : 750 000. Two villages are 18 km apart.

What will be the distance between the two villages on the map?

Give your answer in mm.

1. The volume *V* of a sphere is given by the formula , where *r* is the sphere’s radius.

Find the volume of a sphere with a diameter of m.

1. Calculate the area of this triangle.

6.6 cm

7.5 cm

2.3 cm

105°

**Not to scale**

1. Show that .
2. Show that if a circle has a circumference of 10 cm, it has an area of cm2.
3. The density of water is 1 g per cm3. Show that this is the same as 1000 kg per m3.

6 m

A

B

**Not to scale**

1. Frank uses the cosine rule to find the length AB.

He does the following calculation.







124°

C



so cm

8 m

Identify the mistake Frank has made and show how to find the correct answer.

1. Charlotte runs for 30 seconds at a speed of *u* m/s. She then walks an equal distance at *v* m/s.

Show that the time Charlotte walks for can be expressed as  seconds.

1. In the isosceles triangle ABC, angle A  90° and AB  5 cm.

Calculate the length BC.

1. Town A is on a bearing of 150° from town B.

What is the bearing of town B from town A?

1. Two wires support a tall vertical pole. One wire forms an angle of 24° with the ground and the other wire forms an angle of 65° with the ground. The wires are 25 m apart at ground level.

The length of the longer wire is *w* m.

Find *w*.

65°

24°

**Not to scale**

*w*

25 m

1. Calculate the shaded area of the diagram below.

50°

5 cm

**Not to scale**

20 cm

1. A cube has side length 10 cm, shown below.

What is the direct distance from X to Y?

Y

X

10 cm

Y

X

10 cm

Y

X

10 cm

10 cm

### Answers

1. 



so  km

1. 36.9°
2. 3000 N/m2
3. 30 cm
4. cm2

m2

1.  so distance is  miles
2.  or 3.0 cm
3. km

mm

1.  or m3
2. cm2
3. 
4.  so  (or same from )

cm2

1. 1 m3  106 cm3

so 1 g per cm3 is equivalent to 106 g per m3.

106 g  1000 kg

1.  in third line because  is negative. The answer should be 12.4 cm.
2. Runs 30*u* metres.

 so time walking is  seconds.

A

 or  cm

5

5

C

B

1. 330°

N

N

150°

B

30°

A

330°

1. Third angle in triangle is 91°.



m

1.  or cm2
2. Diagonal of bottom face 

X

10

Y



Distance from X to Y is 

 or cm

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| **Assessment Objective** | **Qu.** | **Topic** | **R** | **A** | **G** |  | **Assessment Objective** | **Qu.** | **Topic** | **R** | **A** | **G** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| AO1 | 1 | Apply the formula for area of a circle |  |  |  |  | AO1 | 1 | Apply the formula for area of a circle |  |  |  |
| AO1 | 2 | Apply trigonometric ratios to find an angle |  |  |  |  | AO1 | 2 | Apply trigonometric ratios to find an angle |  |  |  |
| AO1 | 3 | Use compound units |  |  |  |  | AO1 | 3 | Use compound units |  |  |  |
| AO1 | 4 | Calculate perimeter of a rectilinear shape |  |  |  |  | AO1 | 4 | Calculate perimeter of a rectilinear shape |  |  |  |
| AO1 | 5 | Convert standard units of measure for area |  |  |  |  | AO1 | 5 | Convert standard units of measure for area |  |  |  |
| AO1 | 6 | Know and apply speed = distance ÷ time |  |  |  |  | AO1 | 6 | Know and apply speed = distance ÷ time |  |  |  |
| AO1 | 7 | Know and apply trigonometric ratios to find a length |  |  |  |  | AO1 | 7 | Know and apply trigonometric ratios to find a length |  |  |  |
| AO1 | 8 | Use the scale of a map |  |  |  |  | AO1 | 8 | Use the scale of a map |  |  |  |
| AO1 | 9 | Calculate volume of a sphere |  |  |  |  | AO1 | 9 | Calculate volume of a sphere |  |  |  |
| AO1 | 10 | Know and apply area |  |  |  |  | AO1 | 10 | Know and apply area |  |  |  |
| AO2 | 11 | Know and apply exact trigonometric ratios |  |  |  |  | AO2 | 11 | Know and apply exact trigonometric ratios |  |  |  |
| AO2 | 12 | Know and apply formula for area of a circle |  |  |  |  | AO2 | 12 | Know and apply formula for area of a circle |  |  |  |
| AO2 | 13 | Use and convert compound units |  |  |  |  | AO2 | 13 | Use and convert compound units |  |  |  |
| AO2 | 14 | Know and apply cosine rule to find a length |  |  |  |  | AO2 | 14 | Know and apply cosine rule to find a length |  |  |  |
| AO2 | 15 | Use compound units in an algebraic context |  |  |  |  | AO2 | 15 | Use compound units in an algebraic context |  |  |  |
| AO3 | 16 | Know and apply Pythagoras’ theorem in 2D |  |  |  |  | AO3 | 16 | Know and apply Pythagoras’ theorem in 2D |  |  |  |
| AO3 | 17 | Work with bearings |  |  |  |  | AO3 | 17 | Work with bearings |  |  |  |
| AO3 | 18 | Use and apply sine rule to find a length |  |  |  |  | AO3 | 18 | Use and apply sine rule to find a length |  |  |  |
| AO3 | 19 | Calculate area of a sector given angle and radius |  |  |  |  | AO3 | 19 | Calculate area of a sector given angle and radius |  |  |  |
| AO3 | 20 | Know and apply Pythagoras’ theorem in 3D |  |  |  |  | AO3 | 20 | Know and apply Pythagoras’ theorem in 3D |  |  |  |