# Maths skills – M4.1 Calculate the circumference, surface areas and volumes of regular shapes

You need to be able to calculate the circumference, surface areas and volumes of regular shapes using formulae from GCSE maths in the context of AS/A level biology.

These formulae will not be given in the exam so you must learn them off by heart:



These formulae will be given in the exam if you need them:

### Questions:

Write your answers correct to 3 significant figures.

**1.** Circumference of circle

Radius =

| a) 2.00 cm |  |
| --- | --- |

**2.** Area of circle

Radius =

| a) 2.00 cm |  |
| --- | --- |

**3.** Surface area of cuboid

| a) | b = 6.00 µm | l = 2.00 µm | h = 5.00 µm |  |
| --- | --- | --- | --- | --- |

**4.** Volume of cuboid

| a) | b = 6.00 µm | l = 2.00 µm | h = 5.00 µm |  |
| --- | --- | --- | --- | --- |

**5.** Surface area of cylinder

| a) | r = 2.00 cm | l = 4.00 cm |  |
| --- | --- | --- | --- |

**6.** Volume of cylinder

| a) | r = 2.00 cm | l = 4.00 cm |  |
| --- | --- | --- | --- |

**7.** Surface area of sphere

| a) r = 2.00 cm |  |
| --- | --- |

**8.** Volume of sphere

| a) r = 2.00 cm |  |
| --- | --- |

**9.** Calculate the surface area to volume ratio of a spherical cell that has a radius of 0.50 µm.

|  |
| --- |

### Answers:

Write your answers correct to 3 significant figures.

**1.** Circumference of circle

Radius =

| a) 2.00 cm | 12.6 cm |
| --- | --- |

**2.** Area of circle

Radius =

| a) 2.00 cm | 12.6 cm2 |
| --- | --- |

**3.** Surface area of cuboid

| a) | b = 6.00 µm | l = 2.00 µm | h = 5.00 µm | 104 μm2 |
| --- | --- | --- | --- | --- |

**4.** Volume of cuboid

| a) | b = 6.00 µm | l = 2.00 µm | h = 5.00 µm | 60.0 μm3 |
| --- | --- | --- | --- | --- |

**5.** Surface area of cylinder

| a) | r = 2.00 cm | l = 4.00 cm | 75.6 cm2 |
| --- | --- | --- | --- |

**6.** Volume of cylinder

| a) | r = 2.00 cm | l = 4.00 cm | 50.3 cm3 |
| --- | --- | --- | --- |

**7.** Surface area of sphere

| a) r = 2.00 cm | 50.3 cm2 |
| --- | --- |

**8.** Volume of sphere

| a) r = 2.00 cm | 33.5 cm3 |
| --- | --- |

**9.** Calculate the surface area to volume ratio of a spherical cell that has a radius of 0.50 µm.

| SA:V ratio = 3.1:0.5  SA:V ratio = 6.2:1 |
| --- |

**OCR Resources**: *the small print*OCR’s resources are provided to support the delivery of OCR qualifications, but in no way constitute an endorsed teaching method that is required by the Board, and the decision to use them lies with the individual teacher. Whilst every effort is made to ensure the accuracy of the content, OCR cannot be held responsible for any errors or omissions within these resources.   
© OCR 2017 - This resource may be freely copied and distributed, as long as the OCR logo and this message remain intact and OCR is acknowledged as the originator of this work.

OCR acknowledges the use of the following content: n/a

Please get in touch if you want to discuss the accessibility of resources we offer to support delivery of our qualifications: [resources.feedback@ocr.org.uk](mailto:resources.feedback@ocr.org.uk)

### Produced in collaboration with the University of East Anglia

We’d like to know your view on the resources we produce. By clicking on ‘[Like’](mailto:resources.feedback@ocr.org.uk?subject=I%20liked%20the%20A%20Level%20Biology%20Maths%20resource%20Summary%20Quiz%20M4) or ‘[Dislike](mailto:resources.feedback@ocr.org.uk?subject=I%20disliked%20the%20A%20Level%20Biology%20Maths%20resource%20Summary%20Quiz%20M4)’ you can help us to ensure that our resources work for you. When the email template pops up please add additional comments if you wish and then just click ‘Send’. Thank you.

If you do not currently offer this OCR qualification but would like to do so, please complete the Expression of Interest Form which can be found here: [www.ocr.org.uk/expression-of-interest](http://www.ocr.org.uk/expression-of-interest)

Looking for a resource? There is now a quick and easy search tool to help find free resources for your qualification:   
[www.ocr.org.uk/i-want-to/find-resources/](http://www.ocr.org.uk/i-want-to/find-resources/)

**OCR Resources**: *the small print*OCR’s resources are provided to support the delivery of OCR qualifications, but in no way constitute an endorsed teaching method that is required by the Board, and the decision to use them lies with the individual teacher. Whilst every effort is made to ensure the accuracy of the content, OCR cannot be held responsible for any errors or omissions within these resources.   
© OCR 2018 - This resource may be freely copied and distributed, as long as the OCR logo and this message remain intact and OCR is acknowledged as the originator of this work.

OCR acknowledges the use of the following content: n/a

Please get in touch if you want to discuss the accessibility of resources we offer to support delivery of our qualifications: [resources.feedback@ocr.org.uk](mailto:resources.feedback@ocr.org.uk)