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

## Teacher answers

### Quiz

Calculate the following correct to 3 significant figures.

**1.** Circumference of circle

Radius =

| a) 0.50 µm | 3.14 μm |
| --- | --- |
| b) 3.00 mm | 18.8 mm |

**2.** Area of circle

Radius =

| a) 0.50 µm | 0.795 μm2 |
| --- | --- |
| b) 3.00 mm | 28.3 mm2 |

**3.** Surface area of cuboid

| a) | b = 4.00 cm | l = 6.00 cm | h = 1.00 cm | 68.0 cm2 |
| --- | --- | --- | --- | --- |
| b) | b = 3.00 mm | l = 4.00 mm | h = 3.00 mm | 66.0 mm2 |

**4.** Volume of cuboid

| a) | b = 4.00 cm | l = 6.00 cm | h = 1.00 cm | 24.0 cm3 |
| --- | --- | --- | --- | --- |
| b) | b = 3.00 mm | l = 4.00 mm | h = 3.00 mm | 36.0 mm3 |

**5.** Surface area of cylinder

| a) | r = 0.500 µm | l = 4.00 µm | 14.1 μm2 |
| --- | --- | --- | --- |
| b) | r = 3.00 mm | l = 10.0 mm | 245 mm2 |

**6.** Volume of cylinder

| a) | r = 0.50 µm | l = 4.00 µm | 3.14 μm3 |
| --- | --- | --- | --- |
| b) | r = 3.00 mm | l = 10.0 mm | 283 mm3 |

**7.** Surface area of sphere

| a) r = 0.50 µm | 3.14 μm2 |
| --- | --- |
| b) r = 3.00 mm | 113 mm2 |

**8.** Volume of sphere

| a) r = 0.50 µm | 0.52 µm3 |
| --- | --- |
| b) r = 3.00 mm | 113 mm3 |

**9.** Calculate the surface area to volume ratio of a mitochondrion that is approximately cylindrical in shape and has a length of 7.0 µm and a radius of 0.5 µm.

| $$S.A=2πr\left(r+l\right)$$$$S.A=2π×0.5\left(0.5+7\right)$$$$S.A = 23.5619449 μm^{2} $$$$V=πr^{2}l$$$$V =π×0.5^{2}×7$$$$V = 5.497787144 μm^{3} $$SA:V ratio = 23.6:5.5SA:V ratio = 4.3:1Produced in collaboration with the University of East Anglia |
| --- |

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