

NICKS & TRICKS

LUKE'S GUIDE TO JUNIOR CERT HL MATHS

Topic 6 – Area & Volume

Area & Volume is a super handy topic as **most of the questions** are just using formulas **straight out of the Log Tables**. They can throw it in anywhere on the paper and can also mix it with Geometry and Trigonometry. Learn the nicks & tricks below to be a master of finding any perimeter, area or volume!

- (i) What is Perimeter/Area/Volume?
- (ii) Log Tables Page 8, 9 & 10
- (iii) What is π ?
- (iv) Volume & Surface Area of a Cube/Cuboid

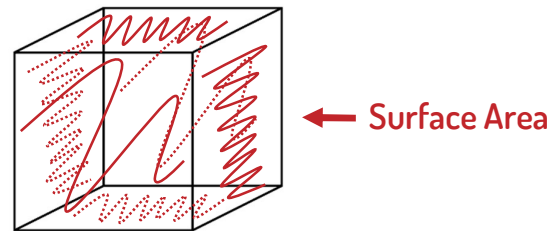
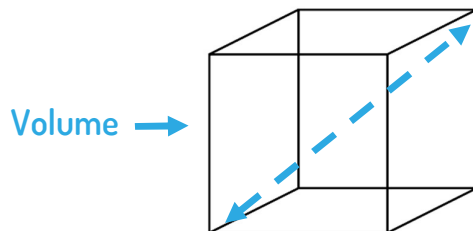
(i) WHAT IS PERIMETER/AREA/VOLUME?

Perimeter is the total length of all the sides of a shape.

Area is the total space a 2D shape takes up.

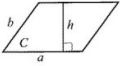
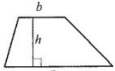

Volume is the total space a 3D shape takes up.

Surface Area is the total area of all the faces of a 3D shape.

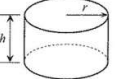
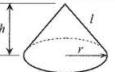



(ii) LOG TABLES PAGE 8, 9 & 10


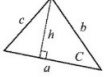
Page 8, 9 & 10 of the Log Tables is the **most important part of this topic!**

Fad agus achar	Length and area	
Seasann A iontu seo a leanas d'achar na fíorach atá i gceist.	In the following, A represents the area of the shape in question.	
Comhthromharán		$A = ah$ $= ab \sin C$
Traipéisiam		$A = \left(\frac{a+b}{2}\right)h$
Ciorcal / Diosca		$l = 2\pi r$ $A = \pi r^2$

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Achar dromchla agus foirt	Surface area and volume	
Seasann A iontu seo d'achar cuar an dromchla agus seasann V do thoirt an tsoláid atá i gceist.	In the following, A represents the curved surface area and V represents the volume of the solid in question.	
Sorcóir		$A = 2\pi rh$ $V = \pi r^2 h$
Cón		$A = \pi rl$ $V = \frac{1}{3}\pi r^2 h$
Sféar		$A = 4\pi r^2$ $V = \frac{4}{3}\pi r^3$

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Stua / Teascóg		Arc / Sector
nuair is ina raidiain atá θ	$l = r\theta$	$A = \frac{1}{2}r^2\theta$
nuair is ina chéimeanna atá θ	$l = 2\pi r \left(\frac{\theta}{360^\circ}\right)$	$A = \pi r^2 \left(\frac{\theta}{360^\circ}\right)$
Triantán		Triangle
áit a bhfuil $s = \frac{a+b+c}{2}$	$A = \frac{1}{2}ah$ $= \frac{1}{2}ab \sin C$	taking $s = \frac{a+b+c}{2}$
		$= \sqrt{s(s-a)(s-b)(s-c)}$

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Read the right-hand column to see what shape each formula is for!

l = Length

A = Area (or Surface Area for 3D shapes)

V = Volume

A lot of questions in this topic will just be asking you to get the area or volume of a shape and all those formulas are here!

(iii) WHAT IS π ?

In some of these formulas you will see the **symbol π** pronounced 'pi' (like the stuff you eat!). It is a special number that has many decimal places, so we just use π instead of writing it all out! Your calculator will also have a special button you can press to enter it in. **Do not be scared of it! It is just a number!**

π

3.1415926535897932384
 626433832795028841971
 69399375105820974944
 5923078164062862089...

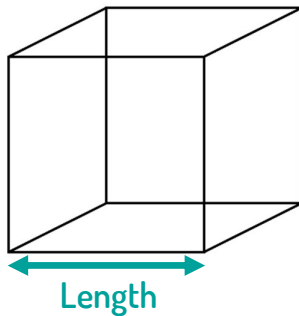
(iv) VOLUME & SURFACE AREA OF A CUBE/CUBOID

The only shapes that do not have formulas in the Log Tables are cubes and cuboids! Here are the ways to get to get Volume and Surface Area for a cube or cuboid:

CUBE

$$\text{Volume} = \text{Length} \times \text{Length} \times \text{Length}$$

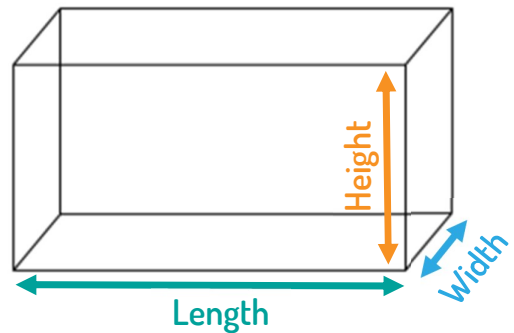
$$\text{Surface Area} = \text{Length} \times \text{Length} \times 6$$



CUBOID

$$\text{Volume} = \text{Length} \times \text{Width} \times \text{Height}$$

$$\begin{aligned} \text{Surface Area} = & \text{Length} \times \text{Width} \times 2 \\ & + \text{Length} \times \text{Height} \times 2 \\ & + \text{Width} \times \text{Height} \times 2 \end{aligned}$$



LUKE'S EXAM PREDICTIONS

- **Volume** has come up at least once every year for the past 5 years!
- **Area** has come up at least once every year for the past 5 years!
- **Perimeter** has come up 2 out of the past 5 years!
- **Surface Area** has come up 2 out of the past 5 years!

If you study this guide, you will be prepared for any Area & Volume questions they have to throw at you in the exam!

*"The only way to **learn** maths is to **do** maths"*