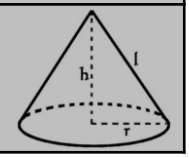
Year 10 Unit 3: Limits and 3D Geometry

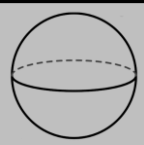
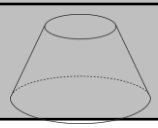
APPRXIMATION AND ESTIMATION	
rounding	writing a number **less accurately** so it is easier to work with below 5, **stay the same,** 5 or above, **round up**
truncating	to shorten by '**chopping off' the end**
decimal place	the position of a digit after the **decimal point**
money	when working in pounds (£) and pence, all answers should be given to **2 decimal places**
significant figure	1st significant figure: the **first digit** in a number which is **not a zero**
estimate a calculation	the **process** of rounding numbers to **one significant figure** and then **calculating** to get an **approximate** answer
approximate	an answer **close** to the exact value
other estimates	**estimated mean** – from a **grouped frequency** table as using the mid-point **estimate from a graph** – as we all draw graphs slightly differently so will get different answers

BOUNDS	
lower bound (LB)	the **smallest value** that would **round up to** the **estimated value**
upper bound (UB)	the **smallest value** that would **round up to** the **next estimated value**
error interval	the **range of values** that a number could have taken **before being rounded or truncated** written as an inequality: **lower bound ≤ x < upper bound**
adding with bounds	**UB + UB = UB** **LB + LB = LB**
subtracting with bounds	**UB – LB = UB** **LB – UB = LB**
multiplying with bounds	**UB x UB = UB** **LB x LB = LB**
dividing with bounds	**UB ÷ LB = UB** **LB ÷ UB = LB**

PROPERTIES OF 3D SHAPES	
surface	the **outside layer** of an object, it has an **area** and **can be flat or curved**
face	any of the **individual flat surfaces** of a **solid object**
edge	for a 3D shape, the **line segment** where **two faces** meet
vertex (vertices)	for a 3D shape, the **point** where **two or more edges meet**, a **corner**

2D REPRESENTATIONS OF 3D SHAPES	
plan	a **2D view** of a **3D solid** as viewed **from above, birds-eye view**
elevation	the **2D view** of a **3D solid from** the **front** or the **side**
net	a **pattern** that you can **cut** and **fold** to make a **model** of a 3D shape

SURFACE AREA		
surface area	the **total area** of all the **surfaces** on a **3D shape,** find the **area of each face** separately, then **add** them together	
surface area of a sphere	$A = 4\pi r^2$	
surface area of a cone	**curved surface area** = πrl **circle base area** = πr^2 **add** these together	

3D SOLIDS: OTHERS		
sphere	**1** face **no** edges **no** vertices	
frustum	a frustum is a solid (usually a **cone** or **pyramid**) with the **top removed**	

VOLUME		
volume	the amount of **space a 3D shape** takes up	
prism	**volume** = **area of cross section x length**	
cube	volume = **one side cubed** (or, **area of square x length of prism**)	$V = l^3$
cuboid	volume = **area of rectangle x length of prism**	$V = lbh$
triangular prism	volume = **area of triangle x length of prism**	$V = \frac{lbh}{2}$
cylinder	volume = **area of circle x length of prism**	$V = \pi r^2 h$
pyramid	volume = $\frac{1}{3}$ **x area of cross section x length**	
square based pyramid	volume = $\frac{1}{3}$ **x area of square base x height of pyramid**	$V = \frac{lwh}{3}$
cone	volume = $\frac{1}{3}$ **x area of circle base x height of cone**	$V = \frac{\pi r^2 h}{3}$
sphere	$V = \frac{4}{3}\pi r^3$	