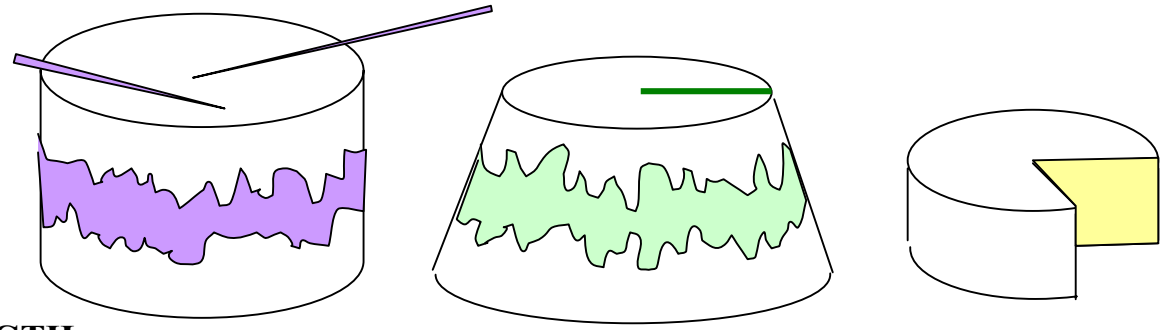
D I M E N S I O N S



LENGTH

Many solutions to questions could start with, "Let the **length** of the short drumstick be x cm."

A single letter may represent the **length** and if we need an expression for the length of five such sticks, laid end to end, we use **5x.** The value **5** has no dimensions – it is a **constant**.

The longer drumstick could have a **length** of y cm and the length of a short and a long drumstick together is written x + y. Even though there ate two letters, this addition represents **length**.

With numbers like 5, 3.5, $\frac{3}{4}$, π, $\frac{\pi}{3}$ etc being **constants** and having no dimensions, expressions like

x, p + q, 5b, 3(p + q), πd, 2πr, a + b + c all represent **lengths.**

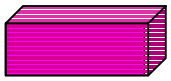
AREAS

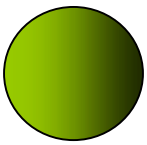
Two-dimensional shapes have area, represented by expressions like:

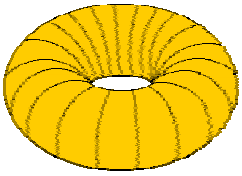
 ab,  r^2,  a(b + c), also  ab + ac

 2ab,  πr^2 ,

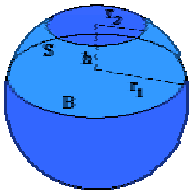
VOLUMES

Three-dimensional shapes have volume and the expressions for volumes contain the multiplication of **three** linear (length) expressions – the simplest being **a** x **b** x **c** **written** **abc.** 

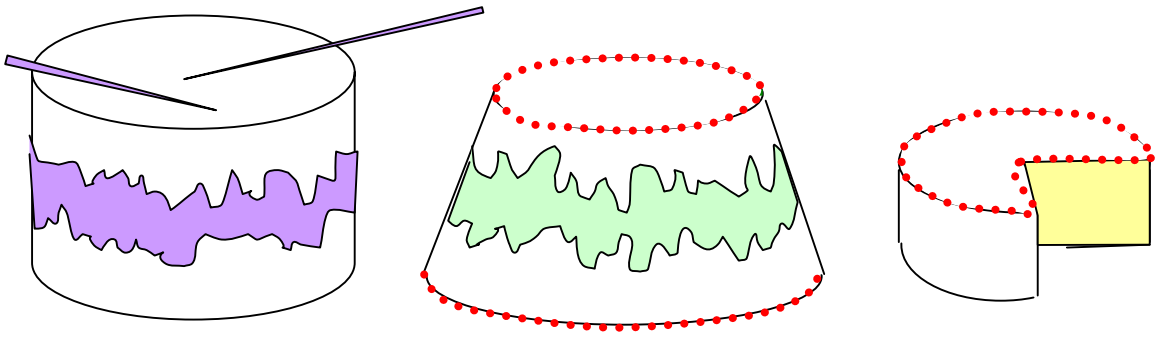
Other expressions for volume are:  r^3,  2 r^3,  $\frac{4\pi}{3}$ r^3,



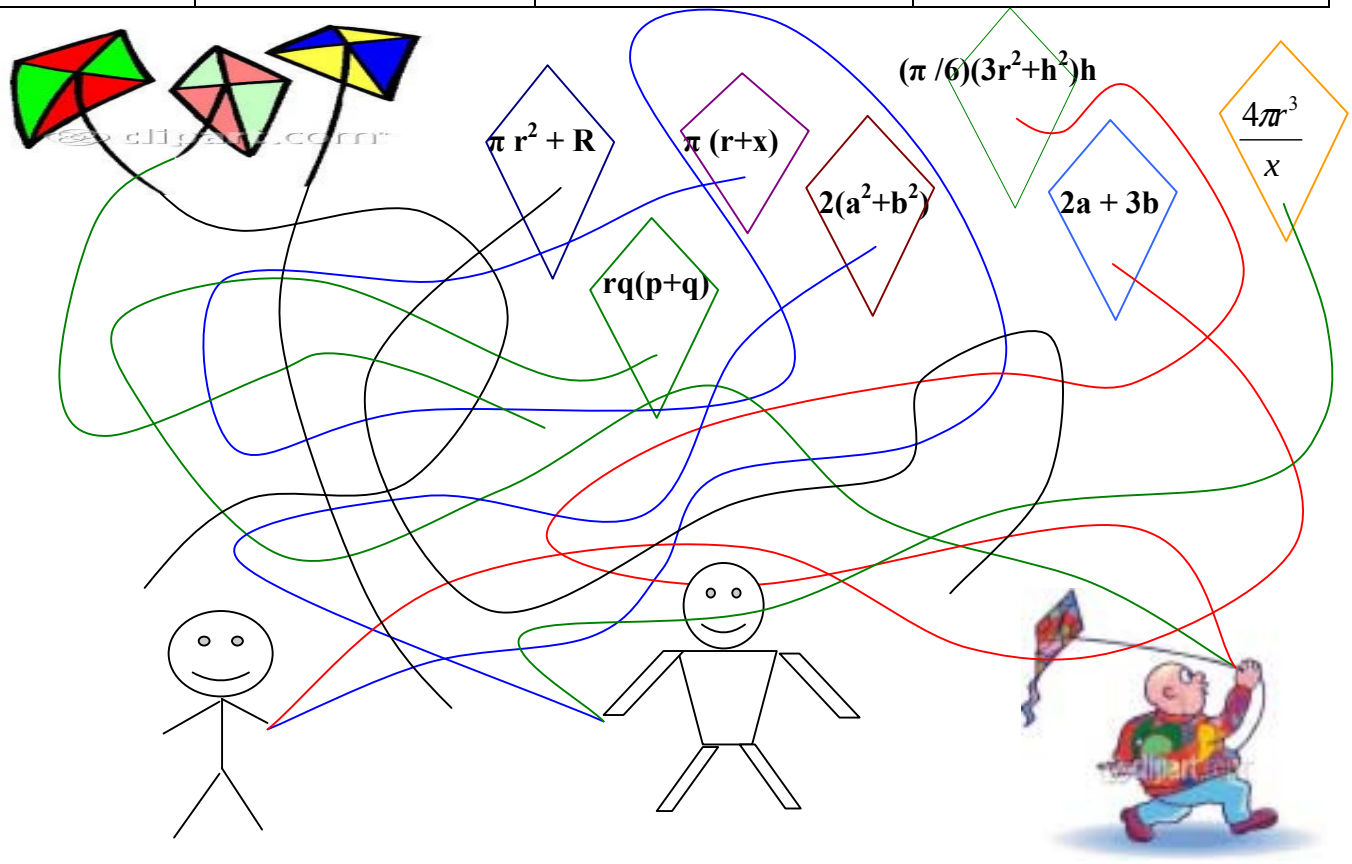
S = 4 π^2Rr V = 2 π^2Rr^2



S = 2 π rh V = (π/6)(3r_1^2+3r_2^2+h^2)h



LENGTH	**x** stick length **2r** diameter **h** height **2πr** circumference	**R** base radius **2πR** base circumference **s** sloping edge **2πr + 2πR** **total rim length**	**h** height $\frac{3}{4}$**πd + 2r** **sector perimeter**
AREA	**π r²** circular top **2πrh** curved surface **2π r² + 2πrh** total surface area	**π (r+R)s** curved surface **π (r[r+s]+R[R+s])** Total surface area	$\frac{3}{4}$ **π r²** **sector area** **2rh +** $\frac{3}{4}$**πdh +** $\frac{3}{2}$**π r²** total surface area
VOLUME	**π r²h** cylinder volume	$\frac{\pi}{3}$ **h (R²+rR+r²)**	$\frac{3}{4}$ **π r²h** cake volume
NONE OF THE ABOVE	**2r + π** **2π r² + 2πr**	**2πr + 2R** $\frac{\pi}{3}$ **h (R²+R+r²)**	**πd + 2rd**



LENGTH AREA VOLUME