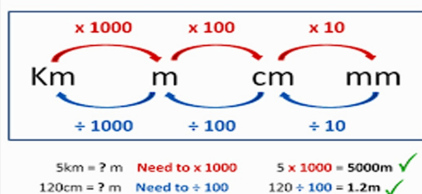


Length

Converting LENGTH Units

It is easiest to use a conversion look-up diagram like the one below.

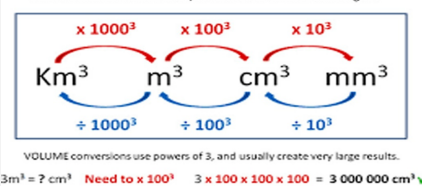


Volume

Converting VOLUME Units

VOLUME is how much 3D space is occupied, and is measured in cubes.

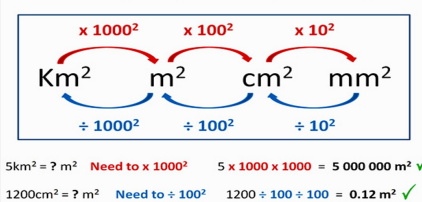
VOLUME consists of Cube Units, so we need to CUBE all our Lengths.



Area

Converting AREA Units

AREA consists of Square Units, so we need to SQUARE all our Lengths.

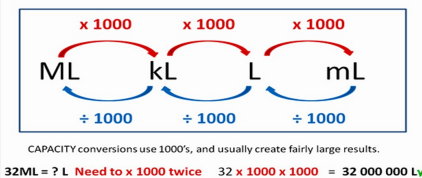


Capacity

Converting CAPACITY Units

The Volume of Liquids and Solids is usually measured as a "Capacity".

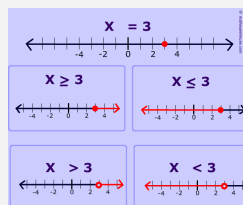
In the Metric System, Capacity is based on the Litre or "L" unit.



Length of Segment

$$\text{Length of line segment} = d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Inequalities



Laws of Indices and Surds

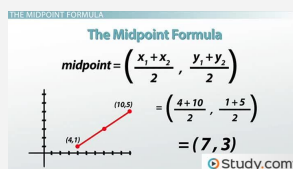
Law of Indices

- $a^m \times a^n = a^{m+n}$
- $\frac{a^m}{a^n} = a^{m-n}$
- $(a^m)^n = a^{m \times n}$
- $(a \cdot b)^n = a^n \cdot b^n$
- $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$
- $a^0 = 1$

Law of Surds

- $\sqrt[n]{a} = a^{\frac{1}{n}}$
- $\sqrt[n]{a \cdot b} = \sqrt[n]{a} \times \sqrt[n]{b}$
- $\sqrt[n]{\frac{a}{b}} = \frac{\sqrt[n]{a}}{\sqrt[n]{b}}$
- $(\sqrt[n]{a})^m = \sqrt[n]{a^m}$
- $\sqrt[n]{\sqrt[n]{a}} = \sqrt[n]{a^{\frac{1}{n}}}$
- $(\sqrt[n]{a})^m = \sqrt[n]{a^m}$

Midpoint



Area

Trapezoid $A + (b_1 + b_2 \div 2) \cdot h$

Volume

Cube	$V = s^3$
Cuboid	$V = lwh$
Prism	$V = Bh$
Cylinder	$V = \pi r^2 h$
Hollow Cylinder	$V = \pi R^2 h - \pi r^2 h$
Cone	$V = \frac{1}{3} \pi r^2 h$
Pyramid	$V = \frac{1}{3} Bh$
Sphere	$V = \frac{4}{3} \pi r^3$
Hemisphere	$V = \frac{2}{3} \pi r^3$

Surface Area

Cube	$TSA = 6s^2$
Cuboid	$TSA = 2(lw + lh + wh)$
Prism	$TSA = 2B + ph$
Cylinder	$TSA = 2\pi r^2 + 2\pi rh$
Hollow Cylinder	$TSA = 2\pi rh + 2\pi Rh + 2(\pi R^2 - \pi r^2)$
Cone	$TSA = \pi r^2 + \pi rs$
Regular Pyramid	$TSA = \text{area of base} + \frac{1}{2}ps$
Square Pyramid	$TSA = b^2 + 2bs$
Sphere	$TSA = 4\pi r^2$
Hemisphere	$TSA = 3\pi r^2$

B = area of base

p = perimeter of base

h = height

R = radius of the outer surface

r = radius of the inner surface

s = slant height

b = length of the base

Chapter 4 Summary

The gradient of a horizontal line ($y = \dots$) has a gradient of zero.

The gradient of a vertical line ($x = \dots$) has an undefined gradient.

Perpendicular lines are at right angles. Their gradients m^1 and m^2 are such that $m^1 m^2 = -1$, i.e. $m^2 = -1 \div m^1$

$y = mx$ passes through the origin, substitute $x = 1$ to find another point.

