Essential Mathematics 2025

Queensland Government | QCAA Queensland Curriculum & Assessment Authority

Mensuration

circumference of a circle	$C = 2\pi r$	area of a circle	$A = \pi r^2$
area of a parallelogram	$A = bh$	area of a trapezium	$A = \frac{1}{2}(a+b)h$
area of a triangle	$A = \frac{1}{2}bh$	total surface area of a cone	$S = \pi rs + \pi r^2$
total surface area of a cylinder	$S = 2\pi rh + 2\pi r^2$	surface area of a sphere	$S = 4\pi r^2$
volume of a cone	$V = \frac{1}{3}\pi r^2 h$	volume of a cylinder	$V = \pi r^2 h$
volume of a prism	$V = Ah$	volume of a pyramid	$V = \frac{1}{3}Ah$
volume of a sphere	$V = \frac{4}{3}\pi r^3$		

Measurement

arc length	$l = \frac{\theta}{180}\pi r$
area of sector	$A = \frac{\theta}{360}\pi r^2$

Finance

simple interest	$I = Pin$	$P = \dfrac{I}{in}$	$i = \dfrac{I}{Pn}$	$n = \dfrac{I}{Pi}$
compound interest	$A = P(1+i)^n$			

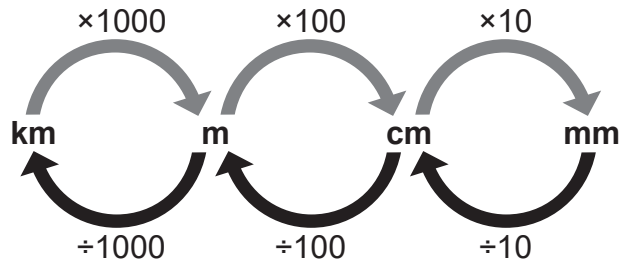| Trigonometry			
Pythagoras' theorem	$c^2 = a^2 + b^2$	$a^2 = c^2 - b^2$	$b^2 = c^2 - a^2$
trigonometric ratios	$\cos\theta = \dfrac{\text{adjacent}}{\text{hypotenuse}}$	$\sin\theta = \dfrac{\text{opposite}}{\text{hypotenuse}}$	$\tan\theta = \dfrac{\text{opposite}}{\text{adjacent}}$

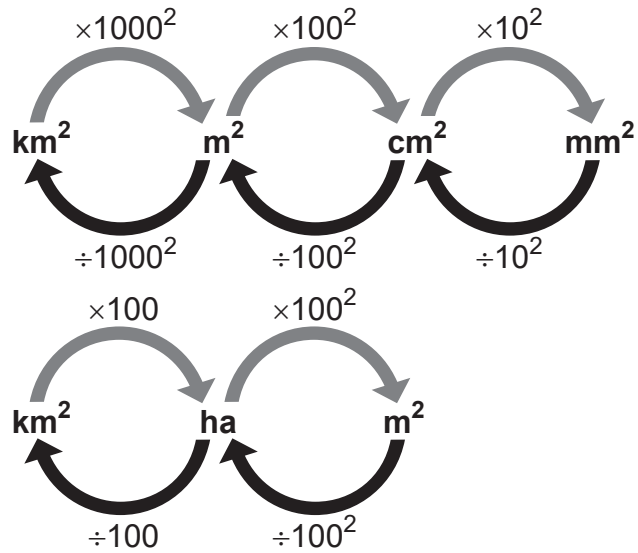| Location and time	
speed	$s = \dfrac{d}{t}$
distance	$d = s \times t$
time	$t = \dfrac{d}{s}$

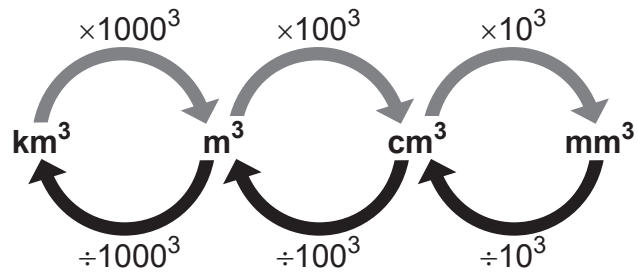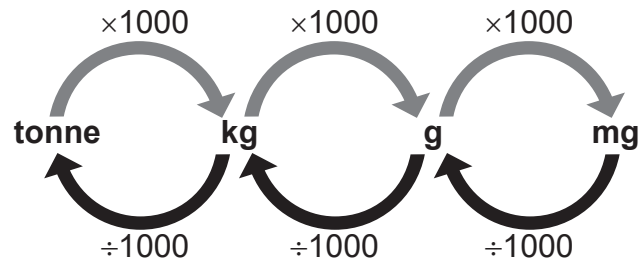| Data	
mean	$\bar{x} = \dfrac{\sum x}{n}$
range	range = highest score – lowest score
interquartile range	$\text{IQR} = Q_3 - Q_1$
equation of line	$y = mx + c$

Conversions	
length unit conversion	×1000 → ×100 → ×10 → **km** **m** **cm** **mm** ÷1000 ÷100 ÷10
area unit conversion	×1000^2 → ×100^2 → ×10^2 → **km^2** **m^2** **cm^2** **mm^2** ÷1000^2 ÷100^2 ÷10^2 ×100 → ×100^2 → **km^2** **ha** **m^2** ÷100 ÷100^2
volume unit conversion	×1000^3 → ×100^3 → ×10^3 → **km^3** **m^3** **cm^3** **mm^3** ÷1000^3 ÷100^3 ÷10^3
mass unit conversion	×1000 → ×1000 → ×1000 → **tonne** **kg** **g** **mg** ÷1000 ÷1000 ÷1000
capacity unit conversion	×1000 → ×1000 → ×1000 → **ML** **kL** **L** **mL** ÷1000 ÷1000 ÷1000