



Mathematics

20-3

Sturgeon Composite High School

Measurement

Imperial to Imperial	Metric to Metric	Imperial to Metric	Metric to Imperial
1 ft = 12 in	1 cm = 10 mm	1 in = 2.54 cm	1 cm = 0.3937 in
1 yd = 3 ft	1 cm = 0.01 m	1 ft = 0.3048 m	1 m = 3.2808 ft
1 yd = 36 in	1 m = 1000 mm	1 yd = 0.9144 m	1 m = 1.0936 yds
1 mi = 5280 ft	1 m = 100 cm	1 mi = 1.6093 km	1 km = 0.6214 mi
1 mi = 1760 yds	1 km = 1000 m		

Volume

Imperial to Imperial	Metric to Metric	Imperial to Metric	Metric to Imperial
1 ft³ = 1728 in³	1 hm³ = 1 000 000 m³	1 in³ = 16.38706 cm³	1 cm³ = 0.06102 in³
1 yd³ = 27 ft³	1 Dam³ = 1000 m³	1 ft³ = 28.3168 dm³	1 m³ = 1.3147 ft³
	1 m³ = 1 000 000 cm³	1 ft³ = 0.02832 m³	1 m³ = 1.30795 yds³
	1 dm³ = 0.001 m³	1 yd³ = 0.764555 m³	1 km³ = 0.23991 mi³
	1 km³ = 1 000 000 000 m³	1 mi³ = 4.16818 km³	
	1 cm³ = 1 mL		

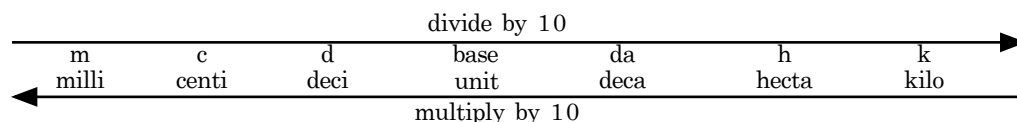
Capacity

Imperial to Imperial	Metric to Metric	Imperial to Metric	Metric to Imperial
1 fl oz = 2 tablespoons	1 kL = 1000 L	1 gallon (US) = 3.7854 L	1 mL = 0.03 fl oz (US)
1 cup = 8 fl oz	1 hL = 100 L	1 gallon (Imp) = 4.5461 L	1 mL = 0.03 fl oz (US)
1 pint = 2 cups	1 Dal = 10 L	1 fl oz (US) = 29.5735 mL	1 L = 2.11338 pint (US)
1 quart = 2 pints	1 L = 10 dL	1 fl oz (Imp) = 28.4131 mL	1 L = 1.75975 pint (Imp)
1 gallon = 4 quarts	1 L = 100 cL	1 bushel (US) = 35.2391 L	1 L = 1.05669 quart (US)
1 gallon (Imp) = 1.2 gallon (US)	1 L = 1000 mL	1 bushel (Imp) = 36.3688 L	1 L = 0.879877 quart (Imp)
	1 metric cup = 250 mL		1 L = 0.264172 gallon (US)
			1 L = 0.219969 gallon (Imp)

Mass

Imperial to Imperial	Metric to Metric	Imperial to Metric	Metric to Imperial
1 lb = 16 oz	1 g = 1000 mg	1 oz = 28.35 g	1 g = 0.04 oz
1 T (ton) = 2000 lbs	1 kg = 1000 g	1 lb = 0.45 kg	1 kg = 2.21 lb
	1 t (tonne) = 1000 kg	1 T (ton) = 0.91 t (tonne)	1 t (tonne) = 1.10 T (ton)

Metric Staircase



Trigonometry

Trigonometric Ratios

$$\sin(\theta) = \frac{\text{opp}}{\text{hyp}}$$

$$\cos(\theta) = \frac{\text{adj}}{\text{hyp}}$$

$$\tan(\theta) = \frac{\text{opp}}{\text{adj}}$$

Arc Trigonometric Ratios

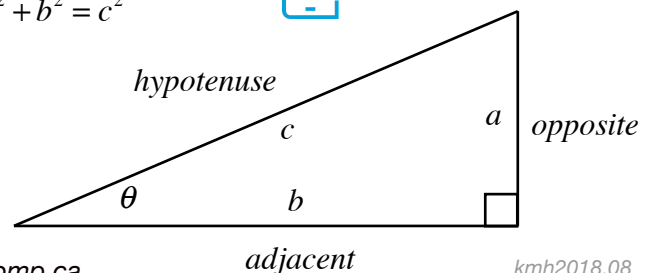
$$\theta = \sin^{-1}\left(\frac{\text{opp}}{\text{hyp}}\right)$$

$$\theta = \cos^{-1}\left(\frac{\text{adj}}{\text{hyp}}\right)$$

$$\theta = \tan^{-1}\left(\frac{\text{opp}}{\text{adj}}\right)$$

Pythagorean Theorem

$$a^2 + b^2 = c^2$$



Area

Imperial to Metric	Metric to Imperial
1 in² = 6.4516 cm²	1 cm² = 0.1550 in²
1 ft² = 0.0929 m²	1 m² = 10.7639 ft²
1 yd² = 0.8361 m²	1 km² = 0.3861 mi²
1 mi² = 2.5900 km²	

Finance

$$I = prt$$

I = Simple Interest (\$)

$$A = p(1+i)^n$$

p = Principal Investment (\$)

r = Annual Interest Rate (%)

$$A = p \left(1 + \frac{r}{n} \right)^{nt}$$

t = Time (yrs)

A = Final Amount (\$)

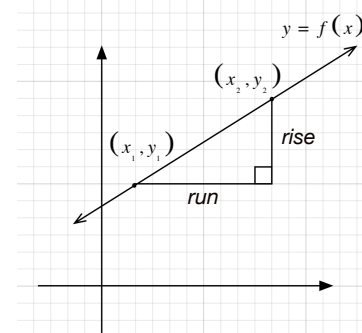
i = Interest Rate per Compound (%)

n = Number of Compounds

Linear Relations

Slope Formula

$$m = \frac{\text{rise}}{\text{run}} \text{ or } \frac{y_2 - y_1}{x_2 - x_1}$$



2D Shapes

Square



$$\text{Area} = l^2$$

$$\text{Perimeter} = 4l$$

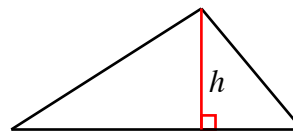
Rectangle



$$\text{Area} = lw$$

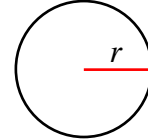
$$\text{Perimeter} = 2l + 2w$$

Triangle



$$\text{Area} = \frac{1}{2}bh$$

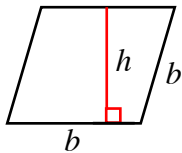
Circle



$$\text{Area} = \pi r^2$$

$$\text{Circumference} = 2\pi r$$

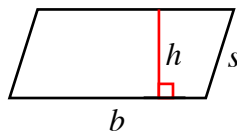
Rhombus



$$\text{Area} = bh$$

$$\text{Perimeter} = 4b$$

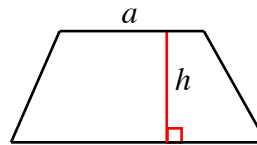
Parallelogram



$$\text{Area} = bh$$

$$\text{Perimeter} = 2b + 2s$$

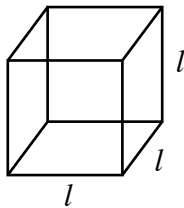
Trapezoid



$$\text{Area} = \left(\frac{a+b}{2} \right) h$$

3D Objects

Cube

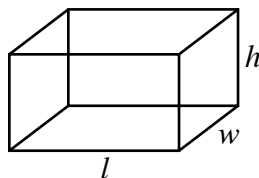


$$\text{Volume} = l^3$$

$$\text{TSA} = 6l^2$$

$$\text{LSA} = 4l^2$$

Rectangular Prism

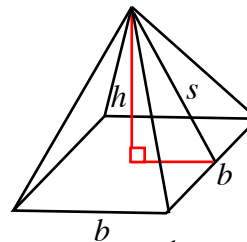


$$\text{Volume} = lwh$$

$$\text{TSA} = 2lw + 2lh + 2wh$$

$$\text{LSA} = 2lh + 2wh$$

Square Pyramid

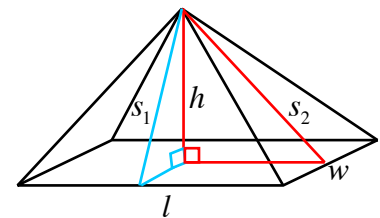


$$\text{Volume} = \frac{1}{3}b^2h$$

$$\text{TSA} = b^2 + 2bs$$

$$\text{LSA} = 2bs$$

Rectangular Pyramid

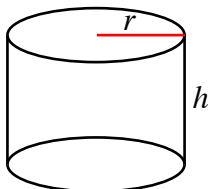


$$\text{Volume} = \frac{1}{3}lwh$$

$$\text{TSA} = lw + ls_1 + ws_2$$

$$\text{LSA} = ls_1 + ws_2$$

Cylinder

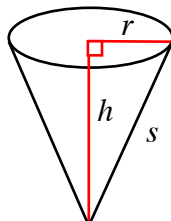


$$\text{Volume} = \pi r^2 h$$

$$\text{TSA} = 2\pi r^2 + 2\pi rh$$

$$\text{LSA} = 2\pi rh$$

Cone

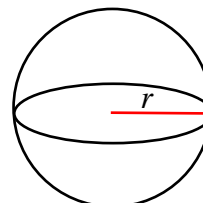


$$\text{Volume} = \frac{1}{3}\pi r^2 h$$

$$\text{TSA} = \pi r^2 + \pi rs$$

$$\text{LSA} = \pi rs$$

Sphere



$$\text{Volume} = \frac{4}{3}\pi r^3$$

$$\text{TSA} = 4\pi r^2$$

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AUGMENT



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