# Mathematics 10C

**Sturgeon Composite High School**

## Measurement

*Conversion Factors*

| 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 | | |

## Exponents

*Exponent Laws*

$x^m \cdot x^n = x^{m+n}$

$x^m \div x^n = x^{m-n}$

$\left[x^m\right]^n = x^{m \times n}$

$\left[xy\right]^n = x^n y^n$

$\left[\frac{x}{y}\right]^n = \frac{x^n}{y^n}$

*Properties*

$x^0 = 1$

$x^{-n} = \frac{1}{x^n}$

$x^{1/2} = \sqrt{x}$

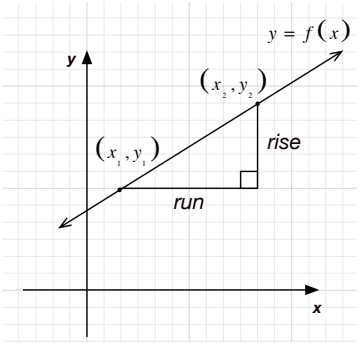
$x^{1/n} = \sqrt[n]{x}$

$x^{m/n} = \sqrt[n]{x^m}$

## Linear Relations

*Slope Formula*

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




*Linear Relation Equations*

*General Form*

$Ax + By + C = 0$

*Standard Form*

$Ax + By = C$

*Point Slope Form*

$(y - y_1) = m(x - x_1)$

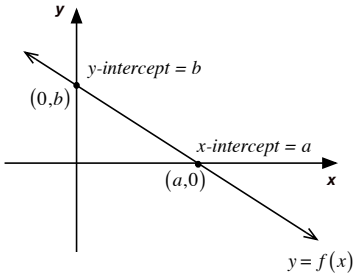
*Special Intercept Forms*

*Slope Y-Intercept*
*(a.k.a. Slope Intercept)*

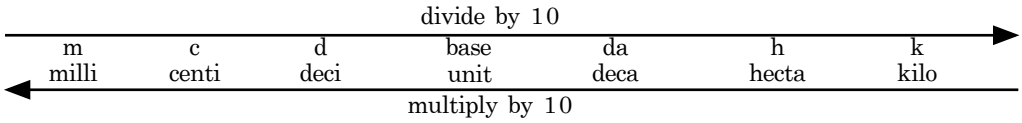
$y = mx + b$

*Slope X-Intercept*

$y = m(x - a)$




## Metric Staircase




## Trigonometry

*Trigonometric Ratios*

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

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

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

*Arc Trigonometric Ratios*

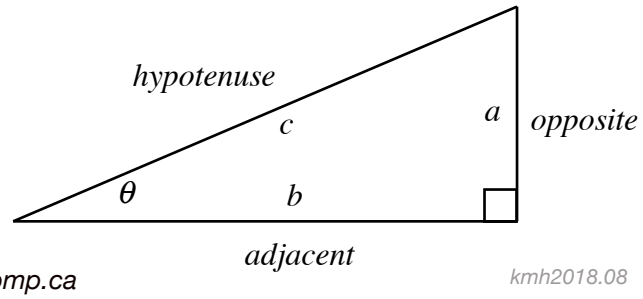
$\theta = Sin^{-1}\left(\frac{opp}{hyp}\right)$

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

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

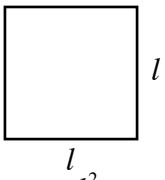
*Pythagorean Theorem*

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



# 2D Shapes

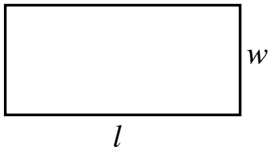
### Square




$Area = l^2$

$Perimter = 4l$

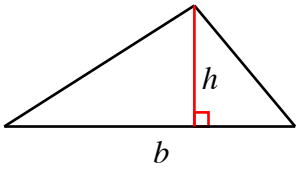
### Rectangle




$Area = lw$

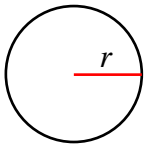
$Perimter = 2l + 2w$

### Triangle




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

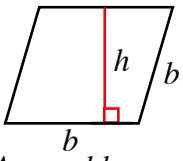
### Circle




$Area = \pi r^2$

$Circumference = 2\pi r$

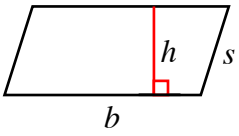
### Rhombus




$Area = bh$

$Perimeter = 4b$

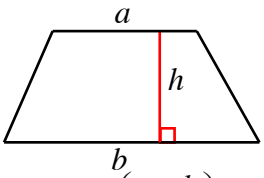
### Parallelogram




$Area = bh$

$Perimeter = 2b + 2s$

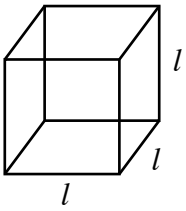
### Trapezoid




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

# 3D Objects

### Cube

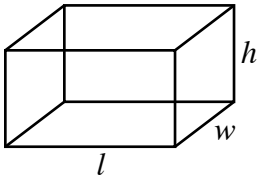



$Volume = l^3$

$TSA = 6l^2$

$LSA = 4l^2$

### Rectangular Prism

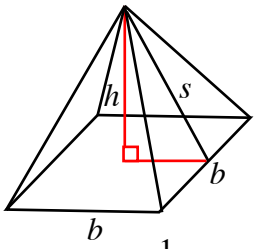



$Volume = lwh$

$TSA = 2lw + 2lh + 2wh$

$LSA = 2lh + 2wh$

### Square Pyramid

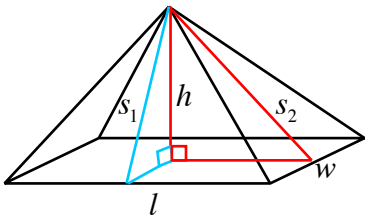



$Volume = \frac{1}{3}b^2h$

$TSA = b^2 + 2bs$

$LSA = 2bs$

### Rectangular Pyramid

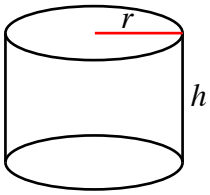



$Volume = \frac{1}{3}lwh$

$TSA = lw + ls_1 + ws_2$

$LSA = ls_1 + ws_2$

### Cylinder

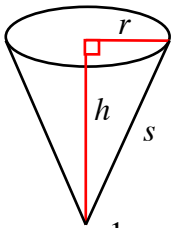



$Volume = \pi r^2 h$

$TSA = 2\pi r^2 + 2\pi rh$

$LSA = 2\pi rh$

### Cone

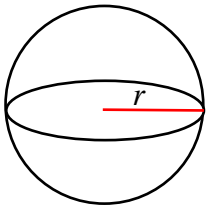



$Volume = \frac{1}{3}\pi r^2 h$

$TSA = \pi r^2 + \pi rs$

$LSA = \pi rs$

### Sphere




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

$TSA = 4\pi r^2$

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