

# FOUNDATIONS OF MATHEMATICS AND PRE-CALCULUS 10

## DATA PAGES

### UNIT CONVERSION

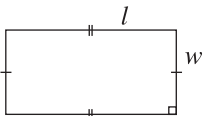
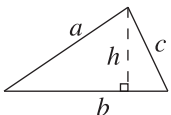
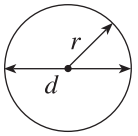
	Common Imperial	Imperial and SI	SI
<b>Length</b>	1 mile = 1760 yards 1 mile = 5280 feet 1 yard = 3 feet 1 yard = 36 inches 1 foot = 12 inches	1 mile $\approx$ 1.609 km 1 yard = 0.9144 m 1 foot = 30.48 cm 1 inch = 2.54 cm	1 km = 1000 m 1 m = 100 cm 1 cm = 10 mm
<b>Mass (Weight)</b>	1 ton = 2000 pounds 1 pound = 16 ounces	2.2 pounds $\approx$ 1 kg 1 pound $\approx$ 454 g 1 ounce $\approx$ 28.35 g	1 t = 1000 kg 1 kg = 1000 g
<b>Common Abbreviations</b>	mile = mi yard = yd feet = ' or ft inch = " or in ton = tn pound = lb ounce = oz		kilometre = km metre = m centimetre = cm millimetre = mm tonne (metric ton) = t gram = g

### FORMULAE

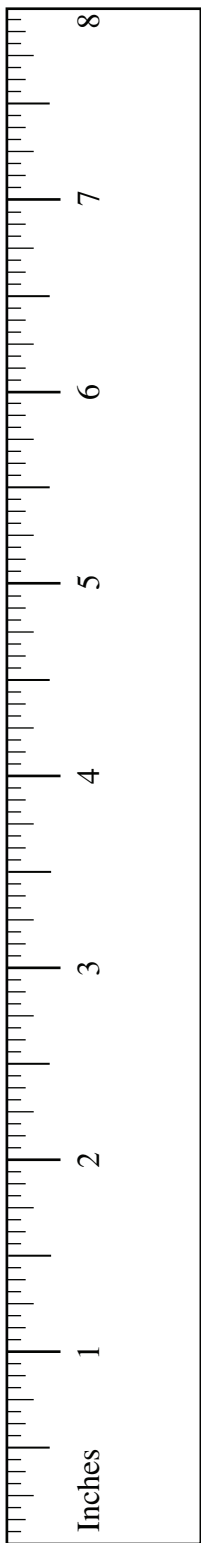
<p>(Put your calculator in Degree Mode)</p> <ul style="list-style-type: none"> <li>Right triangles</li> </ul> $\sin A = \frac{\text{opposite}}{\text{hypotenuse}}$ $\cos A = \frac{\text{adjacent}}{\text{hypotenuse}}$ $\tan A = \frac{\text{opposite}}{\text{adjacent}}$ <div style="text-align: center; margin: 10px 0;"> </div> <p><b>Pythagorean Theorem</b></p> $a^2 + b^2 = c^2$ <p>distance = speed <math>\times</math> time</p>	<ul style="list-style-type: none"> <li>The equation of a line:  <math>y = mx + b</math>  <math>Ax + By + C = 0</math>  <math>y - y_1 = m(x - x_1)</math> </li> <li>The slope of a line:  <math display="block">m = \frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}</math> </li> </ul> <div style="text-align: center; background-color: #e0e0e0; padding: 5px; margin: 10px 0;"><b>Math Tiles Legend</b></div> <table style="width: 100%; text-align: center; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; width: 50px; height: 50px; background-color: white;"></td> <td style="padding: 0 10px;"><math>+x^2</math></td> <td style="border: 1px solid black; width: 50px; height: 50px; background-color: gray;"></td> <td style="padding: 0 10px;"><math>-x^2</math></td> </tr> <tr> <td style="border: 1px solid black; width: 50px; height: 20px; background-color: white;"></td> <td style="padding: 0 10px;"><math>+x</math></td> <td style="border: 1px solid black; width: 50px; height: 20px; background-color: gray;"></td> <td style="padding: 0 10px;"><math>-x</math></td> </tr> <tr> <td style="border: 1px solid black; width: 10px; height: 20px; background-color: white;"></td> <td style="padding: 0 10px;"><math>+1</math></td> <td style="border: 1px solid black; width: 10px; height: 20px; background-color: gray;"></td> <td style="padding: 0 10px;"><math>-1</math></td> </tr> </table>		$+x^2$		$-x^2$		$+x$		$-x$		$+1$		$-1$
	$+x^2$		$-x^2$										
	$+x$		$-x$										
	$+1$		$-1$										

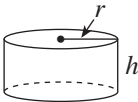
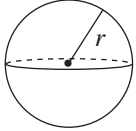
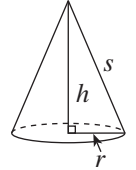
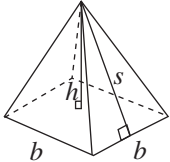
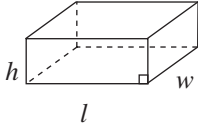
## GEOMETRIC FORMULAE

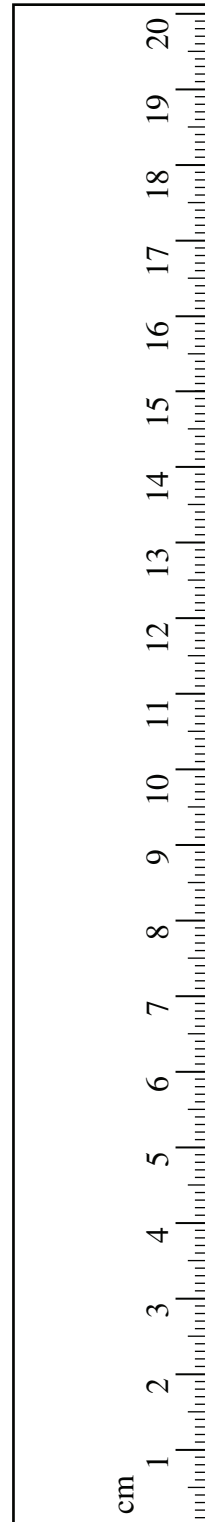
Key Legend	
$l$ = length	$P$ = perimeter
$w$ = width	$C$ = circumference
$b$ = base	$A$ = area
$h$ = height	$SA$ = surface area
$s$ = slant height	$V$ = volume
$r$ = radius	
$d$ = diameter	

Geometric Figure	Perimeter	Area
Rectangle 	$P = 2l + 2w$ or $P = 2(l + w)$	$A = lw$
Triangle 	$P = a + b + c$	$A = \frac{bh}{2}$
Circle 	$C = \pi d$ or $C = 2\pi r$	$A = \pi r^2$

**NOTE:** Use the value of  $\pi$  programmed in your calculator rather than the approximation of 3.14.



Geometric Solid	Surface Area	Volume
Cylinder 	$A_{top} = \pi r^2$ $A_{base} = \pi r^2$ $A_{side} = 2\pi rh$ $SA = 2\pi r^2 + 2\pi rh$	$V = (\text{area of base}) \times h$
Sphere 	$SA = 4\pi r^2$ <b>or</b> $SA = \pi d^2$	$V = \frac{4}{3}\pi r^3$
Cone 	$A_{side} = \pi rs$ $A_{base} = \pi r^2$ $SA = \pi r^2 + \pi rs$	$V = \frac{1}{3} \times (\text{area of base}) \times h$
Square-Based Pyramid 	$A_{triangle} = \frac{1}{2}bs$ (for each triangle) $A_{base} = b^2$ $SA = 2bs + b^2$	$V = \frac{1}{3} \times (\text{area of base}) \times h$
Rectangular Prism 	$SA = wh + wh + lw + lw + lh + lh$ <b>or</b> $SA = 2(wh + lw + lh)$	$V = (\text{area of base}) \times h$
General Right Prism	$SA = \text{the sum of the areas of all the faces}$	$V = (\text{area of base}) \times h$
General Right Pyramid	$SA = \text{the sum of the areas of all the faces}$	$V = \frac{1}{3} \times (\text{area of base}) \times h$



**NOTE:** Use the value of  $\pi$  programmed in your calculator rather than the approximation of 3.14.

**ROUGH WORK SPACE**  
(No marks will be given for work done on this page.)

