W.N.C.P. Grade 12 Foundations Math Formula Sheet

Pythagorean Theorem

$a^2 + b^2 = c^2$, where *c* is the length of the hypotenuse

Linear Relations

Slope: $m = \frac{y_2 - y_1}{x_2 - x_1}$

Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Trigonometry

$$\sin\theta = \frac{opposite}{hypotenuse} \qquad \csc\theta = \frac{hypotenuse}{opposite}$$
$$\cos\theta = \frac{adjacent}{hypotenuse} \qquad \sec\theta = \frac{hypotenuse}{adjacent}$$
$$\tan\theta = \frac{opposite}{adjacent} \qquad \cot\theta = \frac{adjacent}{opposite}$$

Sine Law

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

Cosine Law

$$a^2 = b^2 + c^2 - 2bc\cos(A)$$

Area and Volume: for ALL calculations using π, *<u>always use</u>* **π = 3.14**

Area of a **circle** with radius *r*: $A = \pi r^2$

Circumference of a **circle** with radius *r*: $C = 2\pi r$

Area of a **triangle** with base *b* and height *h*: $A = \frac{1}{2}bh$

Volume of **Prism**:

V = area of base x height of the prism

Volume of **Pyramid**:

V = $\frac{1}{3}\times$ (the volume of the enclosing prism)

Volume of **Cylinder** with height *h* and radius *r*: $V = \pi r^2 h$

Volume of **Sphere** with radius *r*: $V = \frac{4}{3}\pi r^3$

Compound Interest Formula:

$A = P(1 + i)^n$, *A* is the Amount and *P* is the Principal

Combinations and Permutations:

$${}_nP_r = \frac{n!}{(n-r)!} \quad \text{and} \quad {}_nC_r = \frac{n!}{(n-r)!r!}$$