WNCP Grade 11 Foundations and Pre-Calculus Math Formula Sheet

Pythagorean Theorem

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

Linear Relations

Slope: $m = \frac{y_2 - y_1}{x_2 - x_1}$ The equation $y = mx + b$ is one form of a linear relation.

Quadratic Formula

Given the quadratic equation $ax^2 + bx + c = 0$, the quadratic formula is:

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

Trigonometry

$$\sin\theta = \frac{opposite}{hypotenuse}$$
$$\cos\theta = \frac{adjacent}{hypotenuse}$$
$$\tan\theta = \frac{opposite}{adjacent}$$

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, *always use* **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 = $\frac{1}{3}$ × (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*: $V = \frac{4}{3}\pi r^3$

Sequences and Series (for Pre-Calculus course only)

General term of arithmetic sequence: $t_n = a + (n-1)d$

General term of a geometric sequence: $t_n = ar^{n-1}$

Sum of arithmetic series: $S_n = \frac{n}{2}(2a + (n-1)d)$

Sum of geometric series: $S_n = \frac{a(r^n - 1)}{r - 1}$