

W.N.C.P. Grade 12 Pre-Calculus Math Formula Sheet

Pythagorean Theorem

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

Linear Relations

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

Quadratic Formula

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

Trigonometry

$$\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\tan \theta = \frac{\text{opposite}}{\text{adjacent}}$$

$$\csc \theta = \frac{\text{hypotenuse}}{\text{opposite}}$$

$$\sec \theta = \frac{\text{hypotenuse}}{\text{adjacent}}$$

$$\cot \theta = \frac{\text{adjacent}}{\text{opposite}}$$

Sine Law

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

Cosine Law

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

CAST Rule

S	A
T	C

π radians = 180°

Area and Volume: for ALL calculations using π , always use $\pi = 3.14$

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**:

$V = \text{area of base} \times \text{height of the prism}$

Volume of **Pyramid**:

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

Volume of **Cylinder** with height h and radius r :

$$V = \pi r^2 h$$

Volume of **Sphere** with radius r :

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

Combinations and Permutations:

$${}_n P_r = \frac{n!}{(n-r)!} \quad \text{and} \quad {}_n C_r = \frac{n!}{(n-r)!r!}$$