

British Columbia Grade 12 Formula Sheet (Foundations)

Pythagorean Theorem

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

Linear Relations

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

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

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

Area and Volume: for ALL calculations using π , 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**:

Volume = area of base x height of the prism

Volume of **Pyramid**:

Volume = $\frac{1}{3}$ x (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 :

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

Compound Interest Formula:

$A = P(1 + i)^n$, A is the amount, and P is the principal

Permutations and Combinations:

Permutations: ${}_n P_r = \frac{n!}{(n-r)!}$

Combinations: ${}_n C_r = \frac{n!}{(n-r)!r!}$

Probability:

Mutually Exclusive Events:

$$P(A \text{ or } B) = P(A) + P(B)$$

Non-Mutually Exclusive Events:

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$