

British Columbia Grade 12 Formula Sheet (Pre Calculus)

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

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

Compound Interest Formula:

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

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 , 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 \times height of the prism

Volume of **Pyramid**:
Volume = $\frac{1}{3} \times$ (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 :
 $SA = \frac{4}{3}\pi r^3$

Sequences and Series

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

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

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

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

Sum of an infinite geometric series: $S = \frac{a}{1 - r}$