

Summer work - IB SL FORMULA SHEET – you may need the formulas below. You may also access textbooks or your notes from Math Analysis.

	Area of a triangle	$A = \frac{1}{2}(b \times h)$
1.1	The n th term of an arithmetic sequence	$u_n = u_1 + (n-1)d$
	The sum of n terms of an arithmetic sequence	$S_n = \frac{n}{2}(2u_1 + (n-1)d) = \frac{n}{2}(u_1 + u_n)$
	The n th term of a geometric sequence	$u_n = u_1 r^{n-1}$
	The sum of n terms of a finite geometric sequence	$S_n = \frac{u_1(r^n - 1)}{r - 1} = \frac{u_1(1 - r^n)}{1 - r}, r \neq 1$
	The sum of an infinite geometric sequence	$S_\infty = \frac{u_1}{1 - r}, r < 1$
1.2	Exponents and logarithms	$a^x = b \Leftrightarrow x = \log_a b$
	Laws of logarithms	$\log_c a + \log_c b = \log_c ab$ $\log_c a - \log_c b = \log_c \frac{a}{b}$ $\log_c a^r = r \log_c a$
	Change of base	$\log_b a = \frac{\log_c a}{\log_c b}$
1.3	Binomial coefficient	$\binom{n}{r} = \frac{n!}{r!(n-r)!}$
	Binomial theorem	$(a + b)^n = a^n + \binom{n}{1} a^{n-1} b + \dots + \binom{n}{r} a^{n-r} b^r + \dots + b^n$
2.4	Axis of symmetry of graph of a quadratic function	$f(x) = ax^2 + bx + c \Rightarrow$ axis of symmetry $x = -\frac{b}{2a}$
2.6	Relationships between logarithmic and exponential functions	$a^x = e^{x \ln a}$ $\log_a a^x = x = a^{\log_a x}$
2.7	Solutions of a quadratic equation	$ax^2 + bx + c = 0 \Rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}, a \neq 0$
	Discriminant	$\Delta = b^2 - 4ac$

3.2	Trigonometric identity	$\tan \theta = \frac{\sin \theta}{\cos \theta}$
3.3	Pythagorean identity	$\cos^2 \theta + \sin^2 \theta = 1$
	Double angle formulae	$\sin 2\theta = 2 \sin \theta \cos \theta$ $\cos 2\theta = \cos^2 \theta - \sin^2 \theta = 2 \cos^2 \theta - 1 = 1 - 2 \sin^2 \theta$
3.6	Cosine rule	$c^2 = a^2 + b^2 - 2ab \cos C$; $\cos C = \frac{a^2 + b^2 - c^2}{2ab}$
	Sine rule	$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$
	Area of a triangle	$A = \frac{1}{2} ab \sin C$
4.1	Magnitude of a vector	$ v = \sqrt{v_1^2 + v_2^2 + v_3^2}$
4.2	Scalar product	$v \cdot w = v w \cos \theta$ $v \cdot w = v_1 w_1 + v_2 w_2 + v_3 w_3$
	Angle between two vectors	$\cos \theta = \frac{v \cdot w}{ v w }$
5.2	Mean of a set of data	$\bar{x} = \frac{\sum_{i=1}^n f_i x_i}{\sum_{i=1}^n f_i}$