

Formula Sheet**Arithmetic Sequence and Series**

$$t_n = a + (n - 1)d \quad \text{for any integer } n \geq 1$$

$$S_n = \frac{n}{2}(a + l) \quad \text{or} \quad S_n = \frac{n}{2}(2a + (n - 1)d)$$

Geometric Sequence and Series

$$t_n = ar^{n-1}, \quad \text{for any integer } n \geq 1$$

$$S_n = \frac{a(1 - r^n)}{1 - r} = \frac{a - ar^n}{1 - r}; \quad \text{or} \quad \frac{a - rl}{1 - r}, \quad \text{for } r \neq 1$$

$$S_n = \frac{a}{1 - r},$$

$$\text{for } -1 < r < 1 \quad \text{or} \quad |r| < 1$$

Logarithm Rules

Good to know rules for Logarithms: In all cases, $b > 0, b \neq 1$

1. $\log_b 1 = 0$

2. $\log_b b = 1$

3. $\log_b CD = \log_b C + \log_b D$

4. $\log_b \frac{A}{B} = \log_b A - \log_b B$

5. $\log_b A^n = n \log_b A$

6. $\log_b a = \frac{\log_x a}{\log_x b}$

More obscure, but helpful rules for Logarithms: In all cases, $b > 0, b \neq 1$

7. $b^{\log_b a} = a, \quad a > 0$

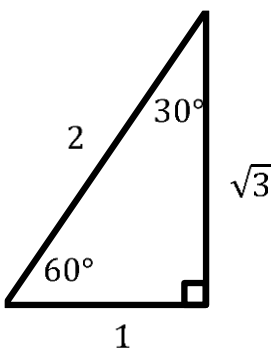
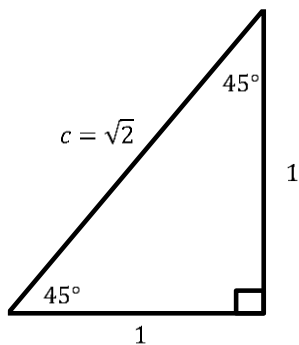
8. $\log_b a = \frac{1}{\log_a b}$

9. $\log_b a = -\log_{\frac{1}{b}} a$

10. $\log_b \frac{1}{x} = -\log_b x$

11. $\frac{\log_a x}{\log_a y} = \frac{\log_b x}{\log_b y}$

12. $\log_b x = \log_b y, \quad \text{only when } x = y$



Radian to Degree Ratio

$$180 : \pi$$

Trigonometric Identities

$\csc \theta = \frac{1}{\sin \theta}$	$\sec \theta = \frac{1}{\cos \theta}$
$\cot \theta = \frac{1}{\tan \theta}$	$\tan \theta = \frac{\sin \theta}{\cos \theta}$
$\cot \theta = \frac{\cos \theta}{\sin \theta}$	$\sin^2 \theta + \cos^2 \theta = 1$
$1 + \tan^2 \theta = \sec^2 \theta$	$1 + \cot^2 \theta = \csc^2 \theta$