

LIST OF FORMULAS YOU MUST KNOW

1. DERIVATIVES

- (1) $\frac{d}{dx}x^n = nx^{n-1}$
- (2) $\frac{d}{dx}\sin x = \cos x$
- (3) $\frac{d}{dx}\cos x = -\sin x$
- (4) $\frac{d}{dx}e^x = e^x$
- (5) $\frac{d}{dx}a^x = a^x \ln a$
- (6) $\frac{d}{dx}\ln x = \frac{1}{x}$

2. TRIGONOMETRY

- (1) $\sin^2 x + \cos^2 x = 1$
- (2) $\tan^2 x + 1 = \sec^2 x$
- (3) $1 + \cot^2 x = \csc^2 x$
- (4) $\sin(x \pm y) = \sin x \cos y \pm \cos x \sin y$
- (5) $\cos(x \pm y) = \cos x \cos y \mp \sin x \sin y$

3. GEOMETRY

- (1) Pythagoras theorem: In a right angled triangle with sides a , b , and hypotenuse c , we have $c^2 = a^2 + b^2$.
- (2) The area of a rectangle is length \times width.
- (3) The area of a circle of radius r is πr^2 .
- (4) The volume of a cuboid is length \times width \times height.
- (5) The volume of a cylinder with radius r and height h is $V = \pi r^2 h$.