

**Definitions and Formulas for Multi-Subject: Secondary Teachers  
(Grade 7–Grade 12) Part Two: Mathematics**

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**ALGEBRA**

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

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**TRIGONOMETRY**

$$\sin A = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos A = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\tan A = \frac{\text{opposite}}{\text{adjacent}}$$

Law of Sines:  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Law of Cosines:  $a^2 = b^2 + c^2 - 2bc \cos A$

Area of a Triangle:  $K = \frac{1}{2}ab \sin C$

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**GEOMETRY**

Area of a Triangle:  $A = \frac{1}{2}ab$

Area of a Trapezoid:  $A = \frac{1}{2}h(b_1 + b_2)$

Lateral Area of a Right Circular Cylinder:  $L = 2\pi rh$

Lateral Area of a Right Circular Cone:  $L = \pi rl$  where  $l$  is the slant height

Surface Area of a Rectangular Prism:  $SA = 2lw + 2hw + 2lh$

Surface Area of a Cylinder:  $SA = 2\pi r^2 + 2\pi rh$

Surface Area of a Sphere:  $SA = 4\pi r^2$

Volume of a Cylinder:  $V = \pi r^2 h$

Volume of a Pyramid:  $V = \frac{1}{3}Bh$  where  $B$  is the area of the base

## Definitions and Formulas (continued)

Volume of a Right Circular Cone:  $V = \frac{1}{3}\pi r^2 h$

Volume of a Sphere:  $V = \frac{4}{3}\pi r^3$

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### COORDINATE GEOMETRY

Slope of a Line:  $m = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$

Sum of a Finite Arithmetic Series:  $S_n = \frac{n(a_1 + a_n)}{2}$

Sum of a Finite Geometric Series:  $S_n = \frac{a_1(1 - r^n)}{1 - r}$

