

MHF 4U Useful Tools & Formulas

Quadratic Equations

Factored Form:

$$y = a(x-s)(x-t)$$

Vertex Form:

$$y = a(x-h)^2 + k$$

Standard Form:

$$y = ax^2 + bx + c$$

Quadratic Formula

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

Trigonometry

$$\sin \theta = \frac{y}{r} \quad \cos \theta = \frac{x}{r} \quad \tan \theta = \frac{y}{x}$$

Reciprocal Identities

$$\csc \theta = \frac{1}{\sin \theta} \quad \sec \theta = \frac{1}{\cos \theta} \quad \cot \theta = \frac{1}{\tan \theta}$$

Fundamental Trigonometric Identities

$$\sin^2 \theta + \cos^2 \theta = 1 \quad \tan \theta = \frac{\sin \theta}{\cos \theta}$$

Compound Angle Formulas

$$\cos(A+B) = \cos A \cos B - \sin A \sin B$$

$$\cos(A-B) = \cos A \cos B + \sin A \sin B$$

$$\sin(A+B) = \sin A \cos B + \cos A \sin B$$

$$\sin(A-B) = \sin A \cos B - \cos A \sin B$$

$$\cos 2A = \cos^2 A - \sin^2 A$$

$$\sin 2A = 2 \sin A \cos A$$

Cofunction Identities

$$\cos x = \sin \left(\frac{\pi}{2} - x \right) \quad \sin x = \cos \left(\frac{\pi}{2} - x \right)$$

$$\cos x = \sin \left(x + \frac{\pi}{2} \right) \quad \sin x = -\cos \left(x + \frac{\pi}{2} \right)$$

Logarithms

$$y = \log_a x \Leftrightarrow a^y = x$$

$$y = \log_a x = \frac{\log x}{\log a}$$

$$\log_a(xy) = \log_a x + \log_a y$$

$$\log_a \left(\frac{x}{y} \right) = \log_a x - \log_a y$$

$$\log_a x^n = n \log_a x$$

Unit Circle

$$(x, y) = (\cos \theta, \sin \theta)$$

