

York University  
MATH 1300 3.00MW – Differential Calculus with Applications  
Formula Sheet

The following are the formulae from trigonometry that you will be given on the midterm and final examinations.

**Trig formulae:**

$$\cos(\pi/4) = \sin(\pi/4) = 1/\sqrt{2}$$

$$\cos(\pi/3) = \sin(\pi/6) = 1/2$$

$$\cos(\pi/6) = \sin(\pi/3) = \sqrt{3}/2$$

$$\sin(-\theta) = -\sin \theta$$

$$\cos(-\theta) = \cos \theta$$

$$1 + \tan^2 \theta = \sec^2 \theta$$

$$1 + \cot^2 \theta = \csc^2 \theta$$

$$\cos^2 \theta + \sin^2 \theta = 1$$

$$\sin(2\theta) = 2 \sin \theta \cos \theta$$

$$\cos^2 \theta = (1 + \cos 2\theta)/2$$

$$\sin^2 \theta = (1 - \cos 2\theta)/2$$

$$\sin(\theta + \phi) = \sin \theta \cos \phi + \sin \phi \cos \theta$$

$$\cos(\theta + \phi) = \cos \theta \cos \phi - \sin \theta \sin \phi$$

$$\cos(2\theta) = \cos^2 \theta - \sin^2 \theta = 2 \cos^2 \theta - 1 = 1 - 2 \sin^2 \theta$$

**Ranges:**

The range of

arcsin is  $[-\frac{\pi}{2}, \frac{\pi}{2}]$ , arccos is  $[0, \pi]$ , arctan is  $(-\frac{\pi}{2}, \frac{\pi}{2})$ , arccot is  $(0, \pi)$ ,

arcsec is  $[-\frac{\pi}{2}, \frac{\pi}{2}] \setminus \{0\}$ , arcsec is  $[0, \pi] \setminus \{\frac{\pi}{2}\}$ .