

**York University AK/AS/SC MATH 1310 3.0AF**  
**Integral Calculus with Applications**

The following are the formulas from trigonometry, and the error bounds on the various integration rules that you will be given on the midterm and final examinations.

**Trig formulae and error bounds:**

$$1 + \tan^2 \theta = \sec^2 \theta \qquad 1 + \cot^2 \theta = \csc^2 \theta$$

$$\cos^2 \theta + \sin^2 \theta = 1 \qquad \sin(2\theta) = 2 \sin \theta \cos \theta$$

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

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

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

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

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

$$\text{midpoint rule: } (b - a)^3 K / 24n^2$$

$$\text{trapezoidal rule: } (b - a)^3 K / 12n^2$$

$$\text{Simpson's rule: } (b - a)^5 M / 180n^4 \quad (n \text{ even})$$