

Midterm 2 formulas

The following formulas will be provided on the exam:

- $\sin^2(\theta) + \cos^2(\theta) = 1$
- $1 + \tan^2(\theta) = \sec^2(\theta)$
- $1 + \cot^2(\theta) = \csc^2(\theta)$
- $\sin(x + y) = \sin(x) \cos(y) + \cos(x) \sin(y)$
- $\cos(x + y) = \cos(x) \cos(y) - \sin(x) \sin(y)$
- $\tan(x + y) = \frac{\tan(x) + \tan(y)}{1 - \tan(x) \tan(y)}$
- $\sin(2x) = 2 \sin(x) \cos(x)$
- $\cos(2x) = \cos^2(x) - \sin^2(x) = 2 \cos^2(x) - 1 = 1 - 2 \sin^2(x)$
- $\tan(2x) = \frac{2 \tan(x)}{1 - \tan^2(x)}$
- $\sin\left(\frac{x}{2}\right) = \pm \sqrt{\frac{1 - \cos(x)}{2}}$
- $\cos\left(\frac{x}{2}\right) = \pm \sqrt{\frac{1 + \cos(x)}{2}}$
- $\tan\left(\frac{x}{2}\right) = \frac{1 - \cos(x)}{\sin(x)} = \frac{\sin(x)}{1 + \cos(x)}$
- Area of a triangle with sides of lengths a and b , and included angle θ :

$$A = \frac{1}{2} ab \sin(\theta)$$