

Accelerated Pre-Calculus
October/November 2022
Unit 4 – Trigonometric Identities

Monday	Tuesday	Wednesday	Thursday	Friday
24 Unit 3 Test	25 PSAT Day No Class	26 4.01 Introduction to Trigonometric Identities <ul style="list-style-type: none"> • Simplifying • Reciprocal ID • Quotient ID • Pythagorean ID HW: 4.01 Worksheet Connect the Dots	27 4.02 Trig Identities cont'd <ul style="list-style-type: none"> • More Simplifying Expressions • Cofunction ID • Even/Odd ID HW: 4.02 Page 451, #5 – 23 odd	28 4.03 Verifying Trig Identities Day 1 HW: Finish 4.03 Wksht
31 4.04 Verifying Trig Identities Day 2 <ul style="list-style-type: none"> • Verifying Identities with Fractions and Rationalizing HW: 4.04 Practice	Nov 1 4.05 Verifying Trig Identities Day 3 <ul style="list-style-type: none"> • Verifying Identities by Factoring HW: 4.05 Practice	2 4.06 Trig Identities Practice CW: Singing Telegram HW: 4.06 Simplifying Trig Expressions Wkst	3 4.07 Trig Identities Quiz HW: Magic Square	4 4.08 Trig Identities <ul style="list-style-type: none"> • Sum/Diff Identities • Verifying Identities HW: 4.08 Wkst
7 4.09 Trig Identities <ul style="list-style-type: none"> • Double Angle Identities • Verifying Identities HW: 4.09 Wkst	8 Remote Day 4.10 Test Review HW: 4.10 Test Review Worksheet	9 4.10 Test Review HW: Study!	10 4.11 Unit 4 Part 1 Test – Identities <ul style="list-style-type: none"> • Simplifying Expressions • Verifying Identities 	11

Homework Keys:

tinyurl.com/MiltonAPC



Trigonometric Identities

Reciprocal Identities:

$$\sin \theta = \frac{1}{\csc \theta}$$

$$\cos \theta = \frac{1}{\sec \theta}$$

$$\tan \theta = \frac{1}{\cot \theta}$$

$$\csc \theta = \frac{1}{\sin \theta}$$

$$\sec \theta = \frac{1}{\cos \theta}$$

$$\cot \theta = \frac{1}{\tan \theta}$$

Quotient Identities:

$$\tan \theta = \frac{\sin \theta}{\cos \theta}$$

$$\cot \theta = \frac{\cos \theta}{\sin \theta}$$

Pythagorean Identities:

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

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

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

Cofunction Identities:

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

$$\csc\left(\frac{\pi}{2} - \theta\right) = \sec \theta$$

$$\tan\left(\frac{\pi}{2} - \theta\right) = \cot \theta$$

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

$$\sec\left(\frac{\pi}{2} - \theta\right) = \csc \theta$$

$$\cot\left(\frac{\pi}{2} - \theta\right) = \tan \theta$$

Even/Odd Identities:

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

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

$$\tan(-\theta) = -\tan \theta$$

$$\csc(-\theta) = -\csc \theta$$

$$\sec(-\theta) = \sec \theta$$

$$\cot(-\theta) = -\cot \theta$$

Sum & Difference Identities:

$$\sin(\alpha \pm \beta) = \sin \alpha \cos \beta \pm \cos \alpha \sin \beta$$

$$\tan(\alpha \pm \beta) = \frac{\tan \alpha \pm \tan \beta}{1 \mp \tan \alpha \tan \beta}$$

$$\cos(\alpha \pm \beta) = \cos \alpha \cos \beta \mp \sin \alpha \sin \beta$$

Double-Angle Identities:

$$\sin 2\theta = 2 \sin \theta \cos \theta$$

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

$$\tan 2\theta = \frac{2 \tan \theta}{1 - \tan^2 \theta}$$

$$= 2 \cos^2 \theta - 1$$

$$= 1 - 2 \sin^2 \theta$$

Half-Angle Identities:

$$\sin \frac{\theta}{2} = \pm \sqrt{\frac{1 - \cos \theta}{2}}$$

$$\cos \frac{\theta}{2} = \pm \sqrt{\frac{1 + \cos \theta}{2}}$$

$$\tan \frac{\theta}{2} = \pm \sqrt{\frac{1 - \cos \theta}{1 + \cos \theta}}$$

$$= \frac{1 - \cos \theta}{\sin \theta} = \frac{\sin \theta}{1 + \cos \theta}$$