Accelerated Pre-Calculus

October/November 2021

Unit 4 – Trigonometric Identities

Monday	Tuesday	Wednesday	Thursday	Friday
25 4.01 Introduction to Trigonometric Identities • Simplifying • Reciprocal ID • Quotient ID • Pythagorean ID HW: 4.01 Worksheet Connect the Dots	26 4.02 Trig Identities cont'd • More Simplifying Expressions • Cofunction ID • Even/Odd ID HW: 4.02 Page 451, #5 – 23 odd	27 4.03 Verifying Trig Identities Day 1 HW: Finish 4.03 Wksht	28 4.04 Verifying Trig Identities Day 2 • Verifying Identities with Fractions and Rationalizing HW: 4.04 Practice	29 **4.05** Verifying Trig Identities Day 3 • Verifying Identities by Factoring HW: 4.05 Practice
Nov 1 4.06 Trig Identities Practice CW: Singing Telegram HW: 4.06 Simplifying Trig Expressions Wkst	2 **4.07 Trig Identities Quiz** HW: Magic Square	3 4.08 Trig Identities • Sum/Diff Identities • Verifying Identities HW: 4.08 Wkst	4 4.09 Trig Identities • Double Angle Identities • Verifying Identities HW: 4.09 Wkst	5 4.10 Test Review HW: 4.10 Test Review Worksheet
8 4.10 Test Review HW: Study!	9 **4.11 Unit 4 Part 1 Test – Identities** • **Simplifying Expressions** • **Verifying Identities**	10	11	12

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:

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

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