

# Unit 01: Accelerated: Trigonometry

Content Area: **Math**  
Course(s): **Generic Course**  
Time Period: **Marking Period 1**  
Length: **12 weeks**  
Status: **Published**

## Unit Introduction

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## Standards

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| MA.F-IF.C.7  | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.  |
| MA.F-IF.C.7e | Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.   |
| MA.F-TF.A.1  | Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.  |
| MA.F-TF.A.2  | Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.  |
| MA.F-TF.A.3  | Use special triangles to determine geometrically the values of sine, cosine, tangent for $\pi/3$ , $\pi/4$ and $\pi/6$ , and use the unit circle to express the values of sine, cosines, and tangent for $\pi - x$ , $\pi + x$ , and $2\pi - x$ in terms of their values for $x$ , where $x$ is any real number. |
| MA.F-TF.A.4  | Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.   |
| MA.F-TF.B.5  | Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.   |
| MA.F-TF.B.6  | Understand that restricting a trigonometric function to a domain on which it is always increasing or always decreasing allows its inverse to be constructed.   |
| MA.F-TF.B.7  | Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context.   |
| MA.F-TF.C    | Prove and apply trigonometric identities   |
| MA.F-TF.C.8  | Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to find $\sin(\theta)$ , $\cos(\theta)$ , or $\tan(\theta)$ given $\sin(\theta)$ , $\cos(\theta)$ , or $\tan(\theta)$ and the quadrant of the angle.   |
| MA.F-TF.C.9  | Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems.  |

## Essential Questions

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## Content

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- 4.1 Radian and Degree Measure: pg 262
- 4.2 Trigonometric Functions: The Unit Circle: pg 272
- 4.3 Right Triangle Trigonometry: pg 279
- 4.4 Trigonometric Functions of Any Angle: pg 290
- 4.5 Graphs of Sine and Cosine Functions: pg 299
- 4.8 Applications and Models: pg 330
- 5.1 Using Fundamental Identities: pg 350
- 5.2 Verifying Trigonometric Identities: pg 357
- 5.3 Solving Trigonometric Equations: pg 364
- 5.4 Sum and Difference Formulas: pg 375
- 5.5 Multiple-Angle and Product-and-Sum Formulas: pg 382

## Skills

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- Describe angles
- Evaluate trigonometric functions of acute angles and use a calculator to evaluate trigonometric functions
- Evaluate trigonometric functions of any angle
- Evaluate trigonometric functions of real numbers
- Evaluate trigonometric functions using the unit circle
- Find reference angles
- Identify a unit circle and describe its relationship to real numbers
- Recognize and write the fundamental trigonometric identities
- Sketch the graphs of basic sine and cosine functions
- Sketch translations of the graphs of sine and cosine functions
- Solve real-life problems involving directional bearings
- Solve real-life problems involving harmonic motion
- Solve real-life problems involving right triangles
- Solve trigonometric equations involving multiple angles
- Solve trigonometric equations of quadratic type
- Use amplitude and period to help sketch the graphs of sine and cosine functions
- Use angles to model and solve real-life problems
- Use domain and period to evaluate sine and cosine functions and use a calculator to evaluate trigonometric functions
- Use half-angle formulas to rewrite and evaluate trigonometric functions
- Use inverse trigonometric functions to solve trigonometric equations
- Use multiple-angle formulas to rewrite and evaluate trigonometric functions
- Use power-reducing formulas to rewrite and evaluate trigonometric functions
- Use product-to-sum and sum-to-product formulas to rewrite and evaluate trigonometric functions
- Use radian measure

- Use sine and cosine functions to model real-life data
- Use standard algebraic techniques to solve trigonometric equations
- Use sum and difference formulas to evaluate trigonometric functions, verify identities, and solve trigonometric equations
- Use the fundamental trigonometric identities
- Use the fundamental trigonometric identities to evaluate trigonometric functions, simplify trigonometric expressions and rewrite trigonometric expressions
- Use trigonometric formulas to write real-life models
- Use trigonometric functions to model and solve real-life problems
- Verify trigonometric identities