**COURSE DESCRIPTION**

**Course Title:** Trigonometry

**Course Number:** 00275

**Course Prerequisites:** Recommended grade of at least 75% in Algebra 1 CP, Algebra 2 CP, and Geometry CP

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| **Course Description:** | Trigonometry is a specialist branch of geometry that deals with the study of triangles. In trigonometry, mathematicians study the relationships between the sides and angles of triangles. Right triangles are a key area of study in this area of mathematics. The content of this course includes functions and graphs, Pythagorean Theorem, the six trigonometric functions and their graphs, trigonometric identities, the Law of Sine and Cosine applied to triangles, inverse functions and equations, and a review of Algebra 2. Applications of this branch of mathematics and algebra in real life are many and varied. This course is recommended for students interested in pursuing careers in engineering, surveying, astronomy, architecture, and aeronautical studies. |

**Suggested Grade Level**: Grades 11-12

**Length of Course:** Two Semesters

**Units of Credit:** 1

**PDE Certification and Staffing Policies and Guidelines (CSPG) Required Teacher Certifications:**

Mathematics #50

To find the CSPG information, go to [CSPG](https://www.education.pa.gov/Educators/Certification/Staffing%20Guidelines/Pages/default.aspx)

**Certification verified by the WCSD Human Resources Department:** Yes No

**WCSD STUDENT DATA SYSTEM INFORMATION**

**Course Level:** Academic

**Mark Types:** Check all that apply.

F – Final Average MP – Marking Period EXM – Final Exam

**GPA Type**:  GPAEL-GPA Elementary  GPAML-GPA for Middle Level  NHS-National Honor Society

UGPA-Non-Weighted Grade Point Average  GPA-Weighted Grade Point Average

**State Course Code**: 02106

To find the State Course Code, go to [State Course Code](https://nces.ed.gov/forum/sced.asp), download the Excel file for *SCED*, click on SCED 6.0 tab, and chose the correct code that corresponds with the course.

**TEXTBOOKS AND SUPPLEMENTAL MATERIALS**

**Board Approved Textbooks, Software, and Materials:**

**Title:**  Trigonometry

**Publisher:** Pearson

**ISBN #:**  9780136763451

**Copyright Date:** 2021

**WCSD Board Approval Date:** 6/29/2020

**Supplemental Materials:** Click or tap here to enter text.

**Curriculum Document**

**WCSD Board Approval:**

**Date Finalized:** 6/5/2020

**Date Approved:**  6/29/2020

**Implementation Year:** 2020-2021

**SPECIAL EDUCATION, 504, and GIFTED REQUIREMENTS**

The teacher shall make appropriate modifications to instruction and assessment based on a student’s Individual Education Plan (IEP), Chapter 15 Section 504 Plan (504), and/or Gifted Individual Education Plan (GIEP).

**SCOPE AND SEQUENCE OF CONTENT, CONCEPTS, AND SKILLS**

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| **Performance Indicator** | **PA Core Standard and/or Eligible Content** | **Month Taught and Assessed for Mastery** |
| Solve linear equations. | 2.2 | September  Choose an item. |
| Identify types of equations. | 2.2 | September  Choose an item. |
| Use the Zero-Product Property. | 2.2 | September  Choose an item. |
| Use the Quadratic Formula. | 2.2 | September  Choose an item. |
| Solve a linear inequality. | 2.2 | September  Choose an item. |
| Find ordered-pair solutions of equations. | 2.2 | September  Choose an item. |
| Graph equations. | 2.2 | September  Choose an item. |
| Find the Center-Radius Form. | 2.2 | September  Choose an item. |
| Graph circles. | 2.2 | September  Choose an item. |
| Decide whether relations define functions. | 2.2 | September  Choose an item. |
| Find domains and ranges of relations. | 2.2 | September  Choose an item. |
| Find domains and ranges from graphs. | 2.2 | September  Choose an item. |
| Use the Vertical Line Test. | 2.2 | September  Choose an item. |
| Identify functions, domains, and ranges. | 2.2 | September  Choose an item. |
| Use function notation. | 2.2 | September  Choose an item. |
| Determine open intervals of a domain. | 2.2 | September  Choose an item. |
| Stretch or shrink graphs. | 2.2 | September  Choose an item. |
| Reflect graphs across axes. | 2.2 | September  Choose an item. |
| Test for symmetry with respect to an axis. | 2.2 | September  Choose an item. |
| Test for symmetry with respect to an origin. | 2.2 | September  Choose an item. |
| Translate a graph vertically. | 2.2 | September  Choose an item. |
| Translate a graph horizontally. | 2.2 | September  Choose an item. |
| Use more than one transformation. | 2.2 | September  Choose an item. |

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| Find the complement and the supplement of an angle. | 2.3 | October  Choose an item. |
| Find measures of complementary and supplementary angles. | 2.3 | October  Choose an item. |
| Calculate with degrees, minutes, and seconds. | 2.2 | October  Choose an item. |
| Convert between angles measures. | 2.2 | October  Choose an item. |
| Find measures of coterminal angles. | 2.2 | October  Choose an item. |
| Find angle measures. | 2.3 | October  Choose an item. |
| Apply the Angle Sum of a Triangle Property. | 2.3 | October  Choose an item. |
| Find angle measures in similar triangles. | 2.3 | October  Choose an item. |
| Find side lengths in similar triangles. | 2.3 | October  Choose an item. |
| Find function values of an angle. | 2.2 | October  Choose an item. |
| Find function values of quadrantal angles. | 2.2 | October  Choose an item. |
| Use the reciprocal identities. | 2.2 | October  Choose an item. |
| Determine signs of functions of non quadrantal angles. | 2.2 | October  Choose an item. |
| Identify the quadrant of an angle. | 2.2 | October  Choose an item. |
| Determine whether a value is in the range of a trigonometric function. | 2.2 | October  Choose an item. |
| Find all function values given one value and the quadrant. | 2.2 | October  Choose an item. |
| Use identities to find function values. | 2.2 | Choose an item.  October |
| Find trigonometric function values of an acute angle. | 2.2 | November  December |
| Write functions in terms of cofunctions | 2.2 | November  December |
| Solve equations using cofunction identities. | 2.2 | November  December |
| Compare function values of acute angles. | 2.2 | November  December |
| Find reference angles. | 2.2 | November  December |
| Find trigonometric function values using reference angles. | 2.2 | November  December |
| Use function values of special angles. | 2.2 | November  December |
| Using coterminal angles to find function values. | 2.2 | November  December |
| Find angle measures given an interval and a function value. | 2.2 | November  December |

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| Find function values with a calculator. | 2.2 | November  December |
| Use inverse trigonometric functions to find angles. | 2.2 | November  December |
| Solve a right triangle given an angle and a side. | 2.3 | November  December |
| Solve a right triangle given two sides. | 2.2, 2.3 | November  December |
| Find a length given the angle of elevation or angle of depression. | 2.2 | November  December |
| Find the angle of elevation or angle of depression. | 2.2 | November  December |
| Solve a problem involving bearing. | 2.2 | November  December |
| Use trigonometry to measure a distance. | 2.2 | November  December |
| Convert degrees to radians and radians to degrees. | 2.2 | December  January |
| Find function values of angles in radian measure. | 2.2 | December  January |
| Find arc length. | 2.3 | December  January |
| Find the area of a sector. | 2.3 | December  January |
| Find exact circular function values suing the unit circle. | 2.2 | December  January |
| Apply circular functions to real-world problems. | 2.2 | December  January |
| Find lengths of line segments. | 2.2 | December  January |
| Use linear and angular speed formulas. | 2.2 | December  January |
| Graph sine and cosine functions. | 2.2 | January  February |
| Determine the sine or cosine function of a graph. | 2.2 | January  February |
| Interpret a sine or cosine function model. | 2.2 | January  February |
| Translate the graphs of sine and cosine. | 2.2 | January  February |
| Apply the sine and cosine functions using a model. | 2.2 | January  February |
| Graph tangent and cotangent functions. | 2.2 | January  February |
| Translate tangent and cotangent functions. | 2.2 | January  February |
| Determine the equation for a graph using tangent and cotangent. | 2.2 | January  February |
| Graph secant and cosecant functions. | 2.2 | January  February |
| Determine the equation for a graph using secant and cosecant. | 2.2 | January  February |

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| Translate the graphs of secant and cosecant. | 2.2 | January  February |
| Model trigonometric functions. | 2.2 | January  February |
| Analyze harmonic motion. | 2.2 | January  February |
| Analyze damped oscillatory motion. | 2.2 | January  February |
| Find trigonometric function values given one value and the quadrant. | 2.2 | February  March |
| Write one trigonometric function in terms of another. | 2.2 | February  March |
| Rewrite an expression in terms of sine and cosine. | 2.2 | February  March |
| Use the fundamental identities. | 2.2 | February  March |
| Verify trigonometric identities. | 2.2 | February  March |
| Simplify expressions using sum and difference identities for cosine. | 2.2 | February  March |
| Find exact cosine function values. | 2.2 | February  March |
| Use cofunction identities to find an angle. | 2.2 | February  March |
| Apply the cosine sum and difference identities to real-world problems. | 2.2 | February  March |
| Simplify expressions using sum and difference identities for sine and tangent. | 2.2 | February  March |
| Find exact sine and tangent function values. | 2.2 | February  March |
| Apply the sine and tangent sum and difference identities to real-world problems. | 2.2 | February  March |
| Simplify expressions using double angle identities. | 2.2 | February  March |
| Find function values of double angles given information about the angle. | 2.2 | February  March |
| Find function values of an angle given information about the double angle. | 2.2 | February  March |
| Derive a multiple-angle identity. | 2.2 | February  March |
| Apply double angle identities to real-world problems. | 2.2 | February  March |
| Simplify expressions using the product-to-sum identity. | 2.2 | February  March |
| Simplify expressions using the sum-to-product identity. | 2.2 | February  March |
| Simplify expressions using the half-angle identities. | 2.2 | February  March |
| Apply half-angle identities to real-world problems. | 2.2 | February  March |
| Use a half-angle identity to find an exact value. | 2.2 | February  March |
| Find inverse sine values. | 2.2 | March  April |

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| Find inverse cosine values. | 2.2 | March  April |
| Find inverse function values. | 2.2 | March  April |
| Find invers function values with a calculator. | 2.2 | March  April |
| Find function values using definitions of the trigonometric functions. | 2.2 | March  April |
| Find functions values using identities. | 2.2 | March  April |
| Write function values in terms of an angle. | 2.2 | March  April |
| Apply inverse function values to real-world problems. | 2.2 | March  April |
| Solve trigonometric equations using the Zero-Factor Method. | 2.2 | March  April |
| Solve trigonometric equations using linear methods. | 2.2 | March  April |
| Solve trigonometric equations using the Quadratic Formula. | 2.2 | March  April |
| Solve trigonometric equations using the squaring method. | 2.2 | March  April |
| Solve trigonometric equations using trigonometric identity substitutions. | 2.2 | March  April |
| Solve applications of trigonometric equations. | 2.2 | March  April |
| Solve an equation with a half-angle. | 2.2 | March  April |
| Solve an equation using a double-angle identity. | 2.2 | March  April |
| Solve an equation with a multiple angle. | 2.2 | March  April |
| Solve an equation for a specified variable. | 2.2 | March  April |
| Solve an equation involving an inverse trigonometric function. | 2.2 | March  April |
| Solve an inverse trigonometric equation using an identity. | 2.2 | March  April |
| Apply the Law of Sines. | 2.2 | April  May |
| Find the area of a triangle. | 2.2 | April  May |
| Solve an ambiguous case using the Law of Sines. | 2.2 | April  May |
| Analyze data involving an obtuse angle. | 2.2 | April  May |
| Apply the Law of Cosines. | 2.2 | April  May |
| Use Heron’s Area Formula to find an area of an oblique triangle. | 2.2 | April  May |
| Solve a triangle using the Law of Sines and Law of Cosines. | 2.2 | April  May |
| Find the magnitude of a resultant. | 2.2 | April  May |

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| Find the magnitude and direction of an equilibrant. | 2.2 | April  May |
| Find a required force. | 2.2 | April  May |
| Find an incline angle. | 2.2 | April  May |
| Apply vectors to a navigation problem. | 2.2 | April  May |
| Find magnitude and direction angle. | 2.2 | April  May |
| Find horizontal and vertical components. | 2.2 | April  May |
| Write vectors in the form <a, b>. | 2.2 | April  May |
| Perform vector operations. | 2.2 | April  May |
| Find dot products. | 2.2 | April  May |
| Find the angle between two vectors. | 2.2 | April  May |

**ASSESSMENTS**

**PSSA Academic Standards, Assessment Anchors, and Eligible Content:** The teacher must be knowledgeable of the PDE Academic Standards, Assessment Anchors, and Eligible Content and incorporate them regularly into planned instruction.

**Formative Assessments:** The teacher will utilize a variety of assessment methods to conduct in-process evaluations of student learning.

**Effective formative assessments for this course include:** Suggested but not limited to: Bell Ringers, Exit Ticket, Cooperative Learning, Observations, Written work, Quizzes, Oral response, Self-evaluation, Homework

**Summative Assessments:** The teacher will utilize a variety of assessment methods to evaluate student learning at the end of an instructional task, lesson, and/or unit.

**Effective summative assessments for this course include:** Suggested but not limited to: Performance Assessment, Tests