**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:** [x] Yes [ ] No

**WCSD STUDENT DATA SYSTEM INFORMATION**

**Course Level:** Academic

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

[x] F – Final Average [x] MP – Marking Period [x] EXM – Final Exam

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

[x]  UGPA-Non-Weighted Grade Point Average [x]  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 | SeptemberChoose an item. |
| Identify types of equations. | 2.2 | SeptemberChoose an item. |
| Use the Zero-Product Property. | 2.2 | SeptemberChoose an item. |
| Use the Quadratic Formula. | 2.2 | SeptemberChoose an item. |
| Solve a linear inequality. | 2.2 | SeptemberChoose an item. |
| Find ordered-pair solutions of equations. | 2.2 | SeptemberChoose an item. |
| Graph equations. | 2.2 | SeptemberChoose an item. |
| Find the Center-Radius Form. | 2.2 | SeptemberChoose an item. |
| Graph circles. | 2.2 | SeptemberChoose an item. |
| Decide whether relations define functions. | 2.2 | SeptemberChoose an item. |
| Find domains and ranges of relations. | 2.2 | SeptemberChoose an item. |
| Find domains and ranges from graphs. | 2.2 | SeptemberChoose an item. |
| Use the Vertical Line Test. | 2.2 | SeptemberChoose an item. |
| Identify functions, domains, and ranges. | 2.2 | SeptemberChoose an item. |
| Use function notation. | 2.2 | SeptemberChoose an item. |
| Determine open intervals of a domain. | 2.2 | SeptemberChoose an item. |
| Stretch or shrink graphs. | 2.2 | SeptemberChoose an item. |
| Reflect graphs across axes. | 2.2 | SeptemberChoose an item. |
| Test for symmetry with respect to an axis. | 2.2 | SeptemberChoose an item. |
| Test for symmetry with respect to an origin. | 2.2 | SeptemberChoose an item. |
| Translate a graph vertically. | 2.2 | SeptemberChoose an item. |
| Translate a graph horizontally. | 2.2 | SeptemberChoose an item. |
| Use more than one transformation. | 2.2 | SeptemberChoose an item. |

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

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

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

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

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

**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