

Translate between the geometric description and the equation for a conic section (Standards G.GPE.1)	
Standard II.G.GPE.1: Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.	
Concepts and Skills to Master	
<ul style="list-style-type: none"> • Use the Pythagorean Theorem to derive the equation of a circle. • Find the center and radius of a circle, given its equation. 	
Related Standards: Current Course	Related Standards: Future Courses
II.A.SSE.1 , II.A.SSE.3.b , II.A.CED.2 , II.G.GPE.4 , II.G.GPE.6 , II.G.GMD.1 , II.G.GMD.3 , II.G.SRT.1 , All circle standards in Math II (II.G.C)	III.F.TF.2 ; III.A.CED.2 , III.G.GMD.4 , III.G.MG.1 , III.G.MG.3

Support for Teachers

Critical Background Knowledge
<ul style="list-style-type: none"> • Use coordinates and absolute value to find distance between points with the same x-coordinate or the same y-coordinate (6.NS.8) • Use coordinates to find the length of a side joining points with the same x coordinate or the same y coordinate (6.G.3) • Know the formulas for the area and circumference of a circle (7.G.4) • Use the Pythagorean Theorem to find the distance between two points (8.G.8) • Use coordinates to prove simple geometric theorems algebraically (I.G.GPE.4) • Complete the square (II.A.SSE.3.b) • Use the method of completing the square to transform equations into desired forms (I.A.REI.4)
Academic Vocabulary
circle, center of a circle, radius of a circle, completing the square
Resources
Curriculum Resources : http://www.uen.org/core/core.do?courseNum=5620#71559

Use coordinates to prove simple geometric theorems algebraically. Include simple proofs involving circles (Standards G.GPE.4)	
Standard II.G.GPE.4: Use coordinates to prove simple geometric theorems algebraically. <i>For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point $(1, \sqrt{3})$ lies on the circle centered at the origin and containing the point $(0, 2)$.</i>	
Concepts and Skills to Master	
<ul style="list-style-type: none"> Use coordinates to prove simple geometric theorems algebraically. 	
Related Standards: Current Course	Related Standards: Future Courses
II.A.SSE.3 ; II.A.CED.2 ; II.A.REI.4 ; A.REI.7 ; II.G.CO.9 ; II.G.CO.10 ; II.G.CO.11 ; II.G.SRT.1 ; II.G.SRT.2 ; II.G.SRT.4 ; II.G.SRT.5 ; II.G.SRT.6 ; II.G.SRT.7 ; II.G.C.1 ; II.G.C.2 ; II.G.C.3 ; II.G.C.4 ; II.G.C.5 ; II.G.GPE.1 ; II.G.GMD.1	III.G.MG.1 ; III.G.MG.3 ; Pre Calculus G.GPE.2; Pre Calculus G.GPE.3

Support for Teachers

Critical Background Knowledge
<ul style="list-style-type: none"> Compose and understand the coordinate plane (5.G.1) and position pairs of integers on a coordinate plane (6.NS.6c) Graph points in all four quadrants of the coordinate plane (6.NS.8); draw polygons given coordinates for the vertices (6.G.3) Find distance between points with the same x-coordinate or the same y-coordinate (6.NS.8) Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane (8.EE.6) and interpret the equation $y = mx + b$ (8.F.3, 4) Apply the Pythagorean Theorem to find the distance between two points (8.G.8) Know precise definitions of angles, circles, perpendicular line, parallel line and line segment (I.G.CO.1) Create equations in two variables and graph on coordinate axes with labels and scales. (I.A.CED.2) Understand the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane (I.A.REI.10)
Academic Vocabulary
Prove, theorem
Resources
Curriculum Resources : http://www.uen.org/core/core.do?courseNum=5620#71559

Use coordinates to prove simple geometric theorems algebraically. Include simple proofs involving circles (Standards G.GPE.4)	
Standard II.G.GPE.6: Find the point on a directed line segment between two given points that partitions the segment in a given ratio.	
Concepts and Skills to Master	
<ul style="list-style-type: none"> Use coordinate geometry to divide a segment into a given ratio. 	
Related Standards: Current Course	Related Standards: Future Courses
II.G.CO.9 ; II.G.SRT.1 ; II.G.SRT.3 ; II.G.SRT.4 , II.G.GPE.4	III.G.MG.1 ; III.G.MG.3 ; Pre Calculus G.GPE 2; Pre Calculus G.GPE 3

Support for Teachers

Critical Background Knowledge
<ul style="list-style-type: none"> Understand ratio concepts and use ratio reasoning to solve problems (6.RP.1) Use ratio and rate reasoning to solve real-world problems (6.RP.3) Find and position pairs of integers and other rational numbers on a coordinate plane (6.NS.6c) Solve real-world and mathematical problems by graphing points in all four quadrants (6.NS.8) Solve problems involving scale drawings of geometric figures (7.G.1) Compute unit rates associated with ratios of lengths (7.RP.1) Apply Pythagorean Theorem to find distances (8.G.9) Use coordinates to prove simple geometric theorems algebraically (I.G.GPE.4). Make a formal construction for bisecting a line segment (I.G.CO.12)
Academic Vocabulary
directed line segment
Resources
Curriculum Resources : http://www.uen.org/core/core.do?courseNum=5620#71559