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	
• 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
• 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. *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, √3) lies on the circle centered at the origin and containing the point (0, 2).*	
Concepts and Skills to Master	
• 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
• 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	
• 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
• 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