Use coordinates to prove simple geometric theorems algebraically (G.GPE.4-5, 7)
Standard I.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
I.A.CED.2; I.A.CED.3; I.A.CED.4; I.A.REI.3; I.A.REI.6, I.A.REI.10; I.A.REI.11; I.F.IF.1; I.F.IF.4; I.F.IF.5; I.F.IF.7; I.F.IF.9; I.BF.3; All Secondary Math I Geometry Congruence Standards	II.A.SSE.3; II.A.CED.2; II.A.REI.4; II.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)
• 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 of the coordinate plane (6.NS.8)
• Draw polygons in the coordinate plane given coordinates for the vertices. Apply these techniques in the context of solving real-world and mathematical problems. (6.G.3)
• Use coordinates and absolute value to find distance between points with same *x*-coordinate or same *y*-coordinate (6.NS.8)
• Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line (8.F.3, 4)
• 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)
• Apply the Pythagorean Theorem to find the distance between two points. (8.G.8)

Academic Vocabulary
Prove, theorem

Resources
Curriculum Resources: http://www.uen.org/core/core.do?courseNum=5600#70394

Use coordinates to prove simple geometric theorems algebraically (G.GPE.4-5, 7)
Standard I.G.GPE.5: Prove the slope criteria for parallel and perpendicular lines; use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).

Concepts and Skills to Master
• Prove that the slopes of parallel lines are equal.   • Prove that the product of the slopes of perpendicular lines is -1.   • Use slope criteria for parallel and perpendicular lines to solve geometric problems.   • Write the equation of a line parallel or perpendicular to a given line, passing through a given point.

Related Standards: Current Course	Related Standards: Future Courses
I.A.CED.2; I.A.REI.6; I.A.REI.10; I.F.IF.4; I.F.IF.6; I.F.IF.7; I.F.IF.9; I.F.BF.3; I.G.CO.1; I.G.CO.3; I.G.CO.4; I.G.CO.5; I.G.GPE.4; I.G.GPE.7	II.A.SSE.3; II.A.CED.2; II.A.CED.3; II.F.IF.4; II.F.IF.6; II.F.IF.7; II.F.IF.9; II.F.BF.3; 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.2; II.G.C.3; II.G.C.4; II.G.GPE.4; III.G.MG.1; III.G.MG.3

Support for Teachers

Critical Background Knowledge
• Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane and find distance between points with the same *x*-coordinate or the same *y*-coordinate (6.NS.8)   • Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line (8.F.3, 4)   • Use similar triangles to explain why the slope m is the same between any two distinct points (8.EE.6)   • Apply the Pythagorean Theorem to find the distance between two points. (8.G.8)   • Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. (I.A.CED.2)

Academic Vocabulary
Parallel, perpendicular, reciprocal

Resources
Curriculum Resources: http://www.uen.org/core/core.do?courseNum=5600#70394

Use coordinates to prove simple geometric theorems algebraically (G.GPE.4-5, 7)	
Standard I.G.GPE.7: Use coordinates to compute perimeters of polygons and areas of triangles and rectangles; e.g., connect with The Pythagorean Theorem and the distance formula. ▯	
Concepts and Skills to Master	
• Use the distance formula to compute perimeters of polygons and areas of triangles and rectangles.	
Related Standards: Current Course	Related Standards: Future Courses
I.A.CED.2; I.A.CED.3; I.A.CED.4; I.A.REI.6; I.F.IF.4; I.F.IF.5; I.F.IF.7; I.F.BF.3; All Secondary Math I Geometry Congruence Standards; I.G.GPE.4; I.G.GPE.5	II.A.SSE.3; II.A.CED.2; II.A.REI.4; II.A.REI.7; II.G.CO.10; II.G.CO.11; II.G.SRT.2; II.G.SRT.4; II.G.SRT.5; II.G.SRT.6; II.G.SRT.8; II.G.C.1; II.G.C.3; II.G.GPE.4; II.G.GPE.6; II.G.GMD.3; III.G.MG.1; III.G.MG.2; III.G.MG.3; Pre Calculus G.GPE.2; Pre Calculus G.GPE.3

Support for Teachers

Critical Background Knowledge
• Solve real-world and mathematical problems involving perimeters of polygons (3.G.8)
• Compose and understand the coordinate plane (5.G.1) and solve problems by graphing points in all four quadrants of the coordinate plane and use coordinates to find distance between points with same *x*-coordinate or same *y*-coordinate (6.NS.8)
• Draw polygons in the coordinate plane given coordinates for the vertices (6.G.3)
• Solve real-world problems involving area (7.G.6)
• Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line (8.F.3)
• Use similar triangles to explain why the slope *m* is the same between any two distinct points (8.EE.6)
• Apply the Pythagorean Theorem to find the distance between two points. (8.G.8)
Academic Vocabulary
Resources
Curriculum Resources: http://www.uen.org/core/core.do?courseNum=5600#70394