New York State Testing Program

Next Generation Mathematics Test

Performance Level Descriptions

Geometry

Spring 2024

Cluster	Performance Level 5	Performance Level 4	Performance Level 3	Performance Level 2
Experiment with transformations in the plane. **CO.A**			Identify a portion of a circle as an arc of the circle, and a portion of a line as a segment on the line.	Identify angles, circles, perpendicular lines, parallel lines, and line segments. Identify the sides and angles of figures.
	Explain why certain transformations preserve the characteristics of a figure (such as distance and angle measure) as opposed to the transformations that do not.	Compare transformations that preserve distance and angle measure to those that do not. Draw, graph or identify a transformation involving a horizontal and/or vertical stretch. (Ex: graphing a horizontal stretch of scale factor 2 with respect to $\grave{\omega} = 0$ is a transformation that doubles each *x*-coordinate while each *y*-coordinate remains unchanged.)	Identify transformations that preserve distance and angle measure, as opposed to the transformations that do not. Identify when a transformation involves a horizontal stretch and/or a vertical stretch.	Identify the image of a point, an angle, or a line segment from a figure after a transformation. Identify non-congruent polygons from given diagrams using transformations.
		Determine all lines of symmetry for any irregular polygon. Describe the rotations and/or reflections (symmetries) that carry any polygon onto itself.	Determine all lines of symmetry for any regular polygon. Determine the minimum number of degrees required to carry a regular polygon onto itself when rotating the polygon about its center.	Determine horizontal and vertical lines of symmetry. Identify a figure that carries onto itself after a rotation of 90˚ or 180˚.

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Understand congruence in terms of rigid motions. CO.B		Explain why two (or more) given figures are congruent using the definition of congruence[1] when one figure can be mapped onto another figure.	Determine the effects of rigid motions on two or more figures, including preservation of distance, angle measure, and orientation.	Identify when distance and angle measure are preserved when given a figure and its image.
		Explain, using rigid motions, that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent. Determine a missing side length or angle measure		

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	Explain why two given quadrilaterals are similar using similarity transformations.	Determine if two figures are similar by describing a sequence of similarity transformations that maps one tranDC Qq1q17.7 ([11.04 0 0 11.04* [(t)-3 (ran1.04 ([07005 6f i46[m di (e)]Tv03 T50.2.6 (u0Tw 14t (q)-0.7 (u8-9.6ale6 (r)11 (m)-6.3 fa0.014t]To)-9.6)]T		

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Prove theorems involving similarity. SRT.B	Prove theorem(s) or solve problems by using auxiliary lines in diagrams.	Provide a complete line of geometric reasoning to prove relationships between geometric figures or prove a stated geometric theorem. Apply similarity theorems about triangles to explain a geometric relationship.	Provide a partial line of geometric reasoning in an effort to prove a specific geometric statement. Apply similarity theorems about triangles to justify a geometric relationship.	Provide a correct geometric statement pertaining to the given geometric information. Identify corresponding parts with two similar triangles.
		Apply geometric relationships between congruent triangles to solve problems algebraically. Apply geometric relationships between similar triangles to solve problems algebraically. (Ex: altitude drawn to the hypotenuse of a right triangle theorem.)	Apply geometric relationships between congruent triangles to solve problems numerically. Apply geometric relationships between similar triangles to solve problems numerically. (Ex: apply triangle proportionality theorems or determine the length	

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Understand and		Prove that all circles	Determine the scale	Determine the scale

Cluster				

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Translate between the geometric description and the equation of a conic section. **GPE.A**	*Derive the equation of a circle given the coordinates of the center and the length of			

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Use coordinates to prove simple geometric theorems algebraically. GPE.B	* Create a complete line of geometric reasoning to prove geometric figures and relationships or prove a stated geometric theorem when using coordinate geometry and given variable coordinates. (Ex: given *A*(0,0), *B*(*a*,*b*			

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	Determine the endpoint of a directed line segment, given the other endpoint and the point that partitions the segment in a given ratio.	Determine the point on a directed line segment that partitions the segment in a given ratio.	Determine the midpoint of a segment to justify the segment is divided into a 1:1 ratio. Determine the point on a horizontal or vertical directed line segment that partitions the segment in a given ratio on the coordinate plane.	
		Compute perimeters of polygons using coordinates. Compute areas of polygons by utilizing the areas of triangles and rectangles using coordinate geometry. Solve modeling problems involving perimeter and area using coordinate geometry.	Determine the length of a segment using the distance formula.	Compute areas of triangles and trapezoids with horizontal and vertical bases and heights on the coordinate plane.

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Apply geometric concepts in modeling situations. **MG.A**	Develop an appropriate geometric model when given a real-world scenario.	M		