

Geometry End of Course Exam Standards

For each of the following tables:

- Column ① will state the **Primary Standard** which describes the **main focus of the what students should know and be able to do; the basis of curriculum.**
- Column ② will state the **Content Cluster** which describes **related standards that have been grouped together to get to a deeper understanding of the knowledge, skills, and abilities of that concept.**
- Where an asterisk (*) is noted **modeling may be incorporated into instruction and assessment**

| ① Standards | ② Content Cluster Summary |
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| <p>HSG-CO.A.3 Given a rectangle, parallelogram, trapezoid, or regular polygon, describes the rotations and reflections that carry it onto itself.</p> | <p>The following knowledge, skills, and abilities are represented in these standards:</p> <ul style="list-style-type: none"> • Use the idea of shape and size to formulate logical arguments. • Construct logical arguments and critique the reasoning of others |
| <p>HSG-CO.A.5 Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.</p> | |
| <p>HSG-CO.C.10 Prove theorems about triangles. <i>Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.</i></p> | |
| <p>HSG-CO.C.11 Prove theorems about parallelograms. <i>Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals</i></p> | |

① Standards

HSG-SRT.A.2 Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.

HSG-SRT.B.5 Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

HSG-SRT.C.7 Explain and use the relationship between the sine and cosine of complementary angles.

HSG-SRT.C.8 Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.★

② Content Cluster Summary

The following knowledge, skills, and abilities are represented in these standards:

- Explain the idea of similarity (same shape different size)
- Make comparisons and solve problems.

① Standards

HSG-C.A.2 Identify and describe relationships among inscribed angles, radii, and chords. *Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.*

HSG-C.A.3 Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.

HSG-C.B.5 Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.

② Content Cluster Summary

The following knowledge, skills, and abilities are represented in these standards:

- Understand concepts about circles
- Understand relationships with chords, radii, and arcs in circles

| ① Standards | ② Content Cluster Summary |
|--|--|
| <p>HSG-GPE.B.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></p> | <p>The following knowledge, skills, and abilities are represented in these standards:</p> <ul style="list-style-type: none"> • Connect algebra and geometry • Explain algebraic and geometric connections using coordinates |
| <p>HSG-GPE.B.5 Prove the slope criteria for parallel and perpendicular lines and 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).</p> | |
| <p>HSG-GPE.B.7 Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.*</p> | |
| <p>HSG.GMD.A.1 Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. <i>Use dissection arguments, Cavalieri's principle, and informal limit arguments.</i></p> | <p>The following knowledge, skills, and abilities are represented in these standards:</p> <ul style="list-style-type: none"> • Solve problems involving 3-dimensional shapes. • Understand how cross sections and characteristics of 2- and 3-dimensional objects relate to formulas |
| <p>HSG-GMD.A.3 Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.*</p> | |

① Standards

S-CP.A.2 Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.

S-CP.A.3 Understand the conditional probability of A given B as $P(A \text{ and } B)/P(B)$, and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A , and the conditional probability of B given A is the same as the probability of B .

S-CP.A.4 Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. *For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.*

S-CP.B.7 Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model.

② Content Cluster Summary

The following knowledge, skills, and abilities are represented in these standards:

- Find the likelihood of events taking place
- Understand and explain the likelihood of events taking place