TASC Mathematics – the Geometry Content Emphases

Almost ¼ (23%) of the Math on the TASC is Geometry

The following pages list the geometry standards assessed on the TASC and a sample question for each standard[1]. Also noted is whether each standard is a high, medium or low emphasis topic on the TASC

The 23% of the TASC that is geometry is divided up into the following sub-domains:
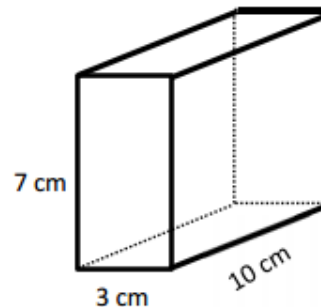
- Geometric Measurement and Dimension – 6%
- Modeling with Geometry – 7%
- Congruence – 5%
- Similarity, Right Triangles, and Trigonometry[2] – 5%

Geometric Measurement and Dimension – 6%

Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems. (High Emphasis)

Sample Items:

1. Find the volume of the rectangular prism in cubic centimeters.

7 cm

10 cm

3 cm

(Correct response: 210 cubic centimeters)

2. Determine the volume of a cylinder with a radius of 3in and a height of 7 in.

3. How is the volume of a cone affected by doubling the height?

4. The surface area of a cube is 486 cm². What is the volume of the cube?

The following volume formulas are provided on the TASC Math Reference Sheet[3]:

Volume

Cylinder:	$V = \pi r^2 h$
Pyramid:	$V = \frac{1}{3}Bh$
Cone:	$V = \frac{1}{3}\pi r^2 h$
Sphere:	$V = \frac{4}{3}\pi r^3$

V = volume
r = radius
h = height
B = area of base

In addition to the formulas above, students may be assessed on the following formulas, which are not given on the TASC Reference Sheet:

- <u>Area of a Rectangle</u>: $A = lw$
- <u>Area of a Triangle</u>: $A = \frac{1}{2} bh$
- <u>Area of a Circle</u>: $A = \pi r^2$
- <u>Volume of a rectangular prism</u>: $V = lwh$

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[3] There have been several changes to the TASC Reference Sheet, reflecting the shifts in the content emphases on the TASC. These are the formulas given on the current TASC (forms G, H, and I and Readiness Test forms 4 and 5)

Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot). *(The examinee will demonstrate an understanding by applying geometric concepts of density in modeling situations.)* (High Emphasis)

Sample Item:
The area of New York City is 302.643 sq mi and the population is 8,550,405. What is the population density of New York City per square mile of the city?

Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder). (Low Emphasis)

Sample Item:

A tennis ball has a diameter of 2.7 inches. Tennis balls come in containers shaped like cylinders. Three tennis balls, stacked one on top of the other, fit exactly into the container. What is the approximate volume of a tennis ball container?

A. 15.5 cubic inches
B. 46.4 cubic inches   (Correct response)
C. 61.8 cubic inches
D. 116.2 cubic inches

Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. *(The examinee will demonstrate an understanding by applying geometric methods in modeling situations.)*. (Low Emphasis)

Sample Items:

1.

A contractor is determining the maximum size of a new concrete patio for a customer.

6 in.   12 ft.   drawing is not to scale
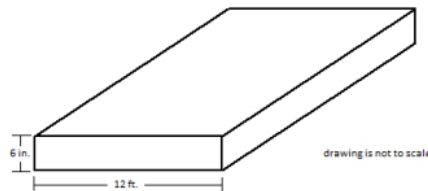
•   The patio is to be rectangular.
•   The thickness of the patio is to be 6 inches.
•   The width of the patio is to be 12 feet.
•   The cost of the concrete is $80.00 per cubic yard.
•   The budget for the concrete is $320.00.

What is the length, in feet, of the largest patio that can be constructed with these conditions?
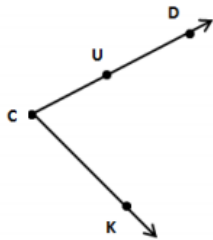
(Correct response: 18 feet)

2. How does doubling the width of a figure affect its area?

3. A rectangular prism has a surface area of 388 cm². What are the possible dimensions?

Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc. (Medium Emphasis)

Sample Items:

1.

Look at the angle.


Which name for the angle is not correct?
A. < DCK
B. < KCU
C. < CDK   (Correct response)
D. < UCK

2. What is the definition of a circle?

3. What type of angles do perpendicular lines form?

Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent. (Low Emphasis)

Sample Item: Look at the transformation.
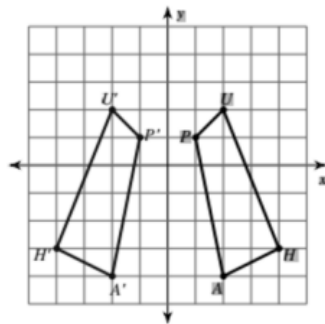
Which rule describes the transformation shown?

A. Reflection across the y-axis (correct answer)   B. Reflection across y = x

C. Rotation 180° about the origin   D. Translation 2 units right

Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures. *(The examinee will demonstrate an understanding by using congruence and similarity criteria for triangles to solve problems. Note: Formal proofs are not being assessed on TASC.)* (Medium Emphasis)

Sample Item[5]:

The triangles to the right are similar triangles.
What is the value of x?
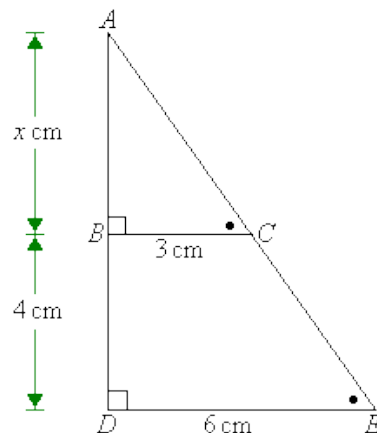
Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. Note: The TASC Reference Sheet provides for students with the Pythagorean Theorem. (Medium Emphasis)

Sample Items:

1.

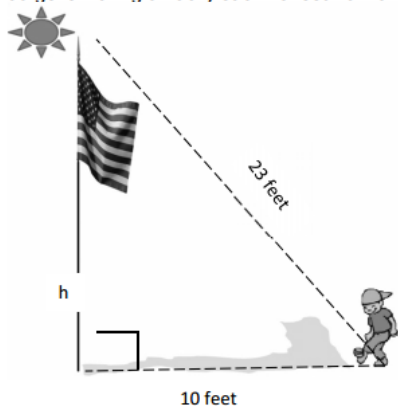Jorge is kicking a hacky sack 10 feet from a flag pole.

Diagram is not drawn to scale.

How tall is the flag pole to the nearest foot?   (Calculator use is permitted for this item)
(Correct response: 21 feet)

2. A tent is shaped like a square-based pyramid. What is the height of the tent?
    (Note: Numbers for this sample item are not provided in the Item Specifications, but would obviously need to be supplied for an exam question)

Additional Useful Vocabulary for Students to Know in Geometry[6]

- Cone
- Congruent
- Cylinder
- Density
- Dilations
- Horizontal
- Parallel
- Perpendicular
- Pi (π, approximately 3.14)
- Pyramid
- Reflections
- Right Angle
- Rotations
- Spheres
- Symmetry
- Transformations
- Translations
- Vertex
- Vertical
- Vertices

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[6] According to the Examinee Guide to the Test Assessing Secondary Completion TASC Test Math Subtest