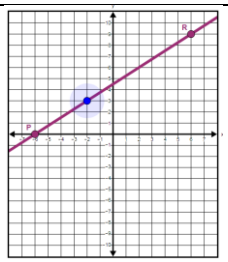
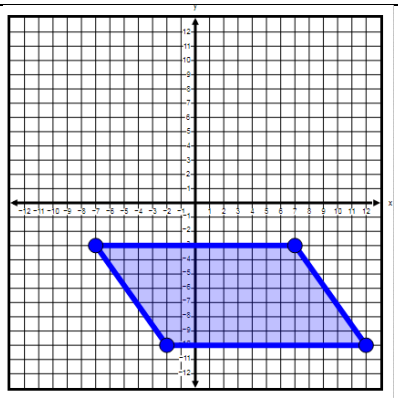
Released Test Answer and Alignment Document

Mathematics – Geometry

Spring 2017

Item Number	Answer Key	Evidence Statement Key
1.	In step 6 of the proof, the statement is △ACE ~ △BCD and the reason is SAS similarity In step 7 of the proof, the statement is ∠CAE ≅ ∠CBD and the reason is Corresponding angles of similar triangles are congruent.	G-CO.C
2.	42 inches	G-SRT.8
3.	In the figure, the length of any line segment in the image is longer than the length of the corresponding line segment in the preimage. The scale factor of the dilation is 2.	G-SRT.1b
4.	Part A: $AC = \lvert h - x \rvert$ $BC = \lvert y - k \rvert$ Part B: $(x - h)^2 + (y - k)^2 = r^2$ or an equivalent equation.	G-GPE.1-2
5.	C, F	G-SRT.6
6.	B, D, E, F	G-CO.6
7.	Part A: $90 - x$ or an equivalent expression Part B: B Part C: $\sin^{-1}\left(\frac{a}{c}\right)$ Measure of $\angle A$; $\cos^{-1}\left(\frac{a}{c}\right)$ Measure of $\angle B$; $\tan^{-1}\left(\frac{a}{b}\right)$ Measure of $\angle A$; $\tan^{-1}\left(\frac{b}{a}\right)$ Measure of $\angle B$ Part D: C	G-SRT.8
8.	Part A: See Rubric Part B: See Rubric Part C: See Rubric	HS-D.1-2
9.	C	G-CO.1
10.	Statement / True / False $\triangle UPW \sim \triangle SRT$ — True $\triangle UPW \sim \triangle UQV$ — False $\triangle UQV \sim \triangle SRT$ — False	G-SRT.2

11.	A	G-SRT.2
12.		G-GPE.6
13.	1,695 or 1,696 or 1,697 cubic inches	G-GMD.3
14.	B, B	G-CO.D
15.	 Part A: Part B: D, E	G-CO.5
16.	Part A: 96 cubic feet Part B: $2,262 Part C: 2 Part D: C, D, E	G-Int.1

<table>
<tr><th colspan="2">#8 Rubric Part A</th></tr>
<tr><th>Score</th><th>Description</th></tr>
<tr><td>2</td><td>
Student response includes each of the following 2 elements:

Computation component = 1 point: Correct total length of 616 feet for the rows of corn.
Modeling component = 1 point: Correct work to support the length of the rows of corn.

Sample Student Response:

Find the exact circumference of the circle that forms the shape of each row.

<table>
<tr><td>Radius (feet)</td><td>10</td><td>20</td><td>30</td><td>40</td></tr>
<tr><td>Diameter (feet)</td><td>20</td><td>40</td><td>60</td><td>80</td></tr>
<tr><td>Circumference (feet)</td><td>20π</td><td>40π</td><td>60π</td><td>80π</td></tr>
</table>

Add the exact circumferences.

$$20\pi + 40\pi + 60\pi + 80\pi = 200\pi \text{ (feet)}$$
Subtract the lengths of the four 3-foot arcs.

$$200\pi - 4(3) = 200\pi - 12 \text{ (feet)}$$
Substitute an approximate value for π.

$$200\pi - 12 \approx 200(3.14) - 12 \text{ (feet)}$$
Simplify.

$$200(3.14) - 12 = 628 - 12 = 616 \text{ (feet)}$$
The total length of the rows that will be planted with corn is about 616 feet.

Note:

A maximum of 1 point can be awarded for correct work/reasoning when the length of the rows of corn is computed, but the work fails to subtract 3 feet from the length of each circle or 12 feet from the total length of the rows of corn.

</td></tr>
<tr><td>1</td><td>Student response includes 1 of the 2 elements.</td></tr>
<tr><td>0</td><td>The response is incorrect or irrelevant.</td></tr>
</table>

#8 Rubric Part B	
Score	**Description**
2	Student response includes each of the following 2 elements: • **Computation component** = 1 point: Correct walkway area of about 1,620 square feet. • **Modeling component** = 1 point: Correct work. Sample Student Response: The shape of the walkway will be a ring. The inner edge of the ring is the largest circle of the maze, with radius labeled as 40 feet. The outer edge of the ring is a circle with radius 6 feet longer than the radius of the largest circle of the maze, so the radius of this circle is $(40 + 6)$ feet, or 46 feet. Find the area, A_o, of the circle formed by the outer edge of the ring. $A_0 = \pi r^2 = \pi(46)^2 = 2{,}116\,\pi$ (square feet) Find the area, A_i, of the circle formed by the inner edge of the ring. $A_i = \pi r^2 = \pi(40)^2 = 1{,}600\,\pi$ (square feet) Subtract these areas: $A_o - A_1 = 2{,}116\pi - 1{,}600\pi = 516\pi$ (square feet) Substitute an approximate value for π. $516\pi \approx 516(3.14)$ (square feet) Simplify. $516(3.14) \approx 1{,}620$ (square feet) The area of the walkway will be about 1,620 square feet.
1	Student response includes 1 of the 2 elements.
0	The response is incorrect or irrelevant.

#8 Rubric Part C	
Score	**Description**

<table>
<tr><td>2</td><td>Student response includes each of the following 2 elements.
• Computation component = 1 point: Correct weight of the pillar (32,987 pounds) and a decision/conclusion that the neighbor's crane is not able to lift the pillar
• Modeling component = 1 point: Correct work

Sample Student Response:

To find the weight of the pillar, I first need to determine its volume. The area B of the base is
$B = \pi r^2$
$= \pi\left(\frac{d}{2}\right)^2$
$= \pi\left(\frac{5}{2}\right)^2$
$= \pi(2.5)^2$
$= 6.25\pi \text{ ft}^2$
The volume of the pillar is
$V = Bh$
$= (6.25\pi)(10)$
$\approx 196.35 \text{ ft}^3$
At 168 pounds per cubic foot, the weight of the pillar is $168 \times 196.35 = 32{,}986.8$ pounds. Tina's family will need to rent a larger crane.

Note:
• A maximum of 1 point can be awarded for part C for the correct work if the diameter is used instead of the radius in calculating the weight of the pillar.</td></tr>
<tr><td>1</td><td>Student response includes 1 of the above elements.</td></tr>
<tr><td>0</td><td>The response is incorrect or irrelevant.</td></tr>
</table>