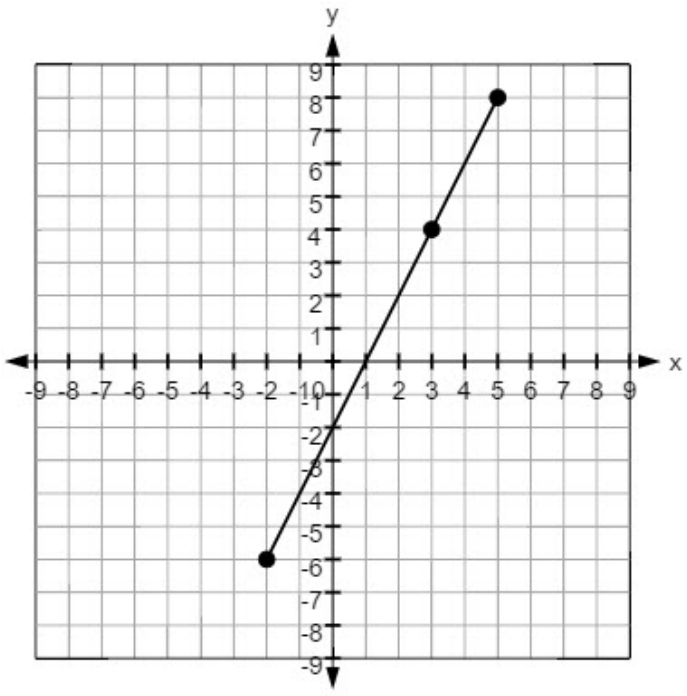
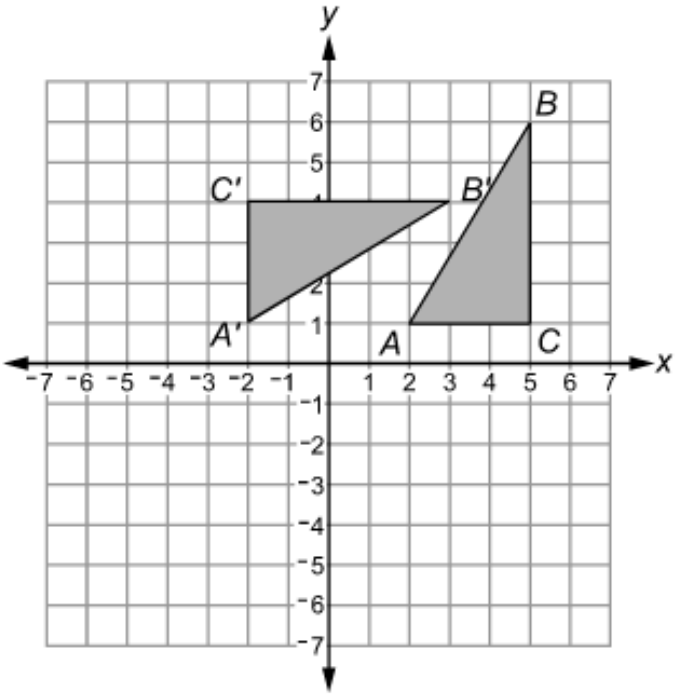
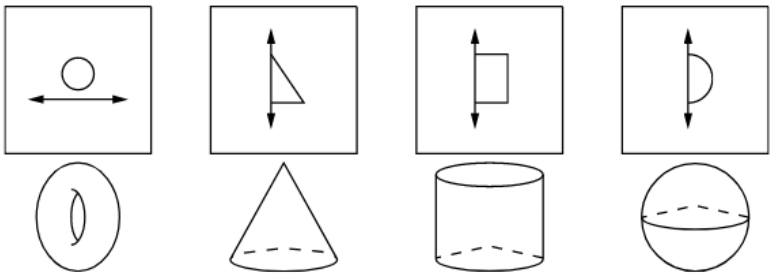
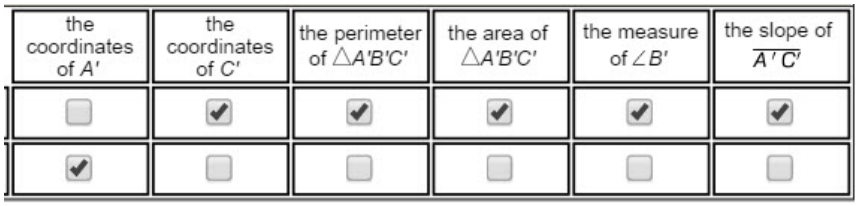
LEAP 2025 Geometry
Practice Test Answer Key

This document contains the answer keys and rubrics for the LEAP 2025 Geometry Practice Test.

Session 1a			
Task #	**Value (Points)**	**Key**	**Alignment**
1	1	The set of all points in a plane that are equidistant from a given point is called a [circle ▾]. The given point is called the [center ▾].	GM: G-CO.A.1
2	1	C	GM: G-SRT.A.1a
3	2	Part A: -1 Part B: 44	GM: G-GPE.A.1
4	1	15	GM: G-SRT.B.5
5	2	Part A: Statement: $\angle CBD \cong \angle BFE$ Reason: [Given ▾] Statement: $\angle CBD \cong \angle ABF$ Reason: [Vertical angles are congruent ▾] Statement: $\angle ABF \cong \angle BFE$ Reason: [Transitive property of congruence ▾] Part B: Statement: $m\angle CBD = m\angle BFE$ Reason: [Given ▾] Statement: $m\angle CBD + m\angle DBF = 180°$ Reason: [Angles that form a linear pair are supplementary ▾] Statement: $m\angle BFE + m\angle DBF = 180°$ Reason: [Substitution property of equality ▾]	LEAP.I.GM.1 GM: G-CO.C.9

<table>
<tr><th colspan="4">Session 1a</th></tr>
<tr><th>Task #</th><th>Value (Points)</th><th>Key</th><th>Alignment</th></tr>
<tr><td>6</td><td>1</td><td> 
</td><td>GM: G-GPE.B.6</td></tr>
<tr><td>7</td><td>1</td><td><table>
<tr><th>Subtended Central Angle</th><th>Arc Length in Radians</th></tr>
<tr><td>$\angle AFB$</td><td>2π</td></tr>
<tr><td>$\angle BFC$</td><td>$\frac{3\pi}{4}$</td></tr>
<tr><td>$\angle CFD$</td><td>$\frac{\pi}{2}$</td></tr>
<tr><td>$\angle AFE$</td><td>π</td></tr>
</table></td><td>LEAP.I.GM.4
GM: G-C.B</td></tr>
</table>

Session 1b			
Task #	**Value (Points)**	**Key**	**Alignment**
8	1	C	GM: G-CO.B.6
9	4	Part A: 243.2 Part B: 1740 Part C: 42.8 Part D: A, B, C	LEAP.I.GM.2 GM: G-MG.A.3 GM: G-GPE.B.7
10	1		GM: G-CO.A.5
11	1		GM: G-GMD.B.4
12	3	Part A: See Rubric Part B: See Rubric	LEAP.II.GM.1 GM: G-GPE.B.4
13	3	Part A: See Rubric Part B: See Rubric	LEAP.III.GM.3 GM: G-SRT.C.8

Session 2			
Task #	**Value (Points)**	**Key**	**Alignment**
14	1	C	GM: G-SRT.C.7
15	1	Side $A'B'$ will [be parallel to] side AB. Side $A'C'$ will [be parallel to] side AC. Side $B'C'$ will [lie on the same line as] side BC.	GM: G-SRT.A.1a
16	1	The value of x is [25].	GM: G-SRT.B.5
17	1	B, C, E, F	GM: G-SRT.A.1b
18	1	A, B, D, E	GM: G-SRT.A.2
19	2	Part A: C Part B: D	LEAP.I.GM.5 GM: S-CP.A
20	2	Part A: 3.4 Part B: C	GM: G-SRT.C.8
21	2	Part A: The measure of $\angle ACD$ is [a third] the measure of $\angle ADC$. Part B: The measure of $\angle ADC$ is [equal to] the measure of $\angle BCD$.	GM: G-C.A.2
22	1		GM: G-CO.B.6
23	1	B, F	GM: G-CO.A.1
24	6	Part A: See Rubric Part B: See Rubric	LEAP.III.GM.1 7.G.A.3 7.G.B.6
25	4	Part A: See Rubric Part B: See Rubric	LEAP.II.GM.4 GM: G-CO.C

<table>
<tr><th colspan="4">Session 3</th></tr>
<tr><th>Task #</th><th>Value (Points)</th><th>Key</th><th>Alignment</th></tr>
<tr><td>26</td><td>1</td><td><table>
<tr><th></th><th>Will be the Same</th><th>Will Not be the Same</th></tr>
<tr><td>The coordinates of A'</td><td>☐</td><td>☑</td></tr>
<tr><td>The coordinates of C'</td><td>☐</td><td>☑</td></tr>
<tr><td>The perimeter of $\triangle A'B'C'$</td><td>☑</td><td>☐</td></tr>
<tr><td>The area of $\triangle A'B'C'$</td><td>☑</td><td>☐</td></tr>
<tr><td>The measure of $\angle B'$</td><td>☑</td><td>☐</td></tr>
<tr><td>The slope of $\overline{A'C'}$</td><td>☑</td><td>☐</td></tr>
</table></td><td>GM: G-CO.B.6</td></tr>
<tr><td>27</td><td>1</td><td>B, D, G</td><td>GM: G-SRT.C.7</td></tr>
<tr><td>28</td><td>2</td><td>Part A: B
Part B: A</td><td>LEAP.I.GM.3
GM: G-CO.D.12</td></tr>
<tr><td>29</td><td>1</td><td>22 or 23</td><td>GM: G-SRT.C.8</td></tr>
<tr><td>30</td><td>1</td><td>7.3</td><td>GM: G-GPE.B.6</td></tr>
<tr><td>31</td><td>1</td><td>30 to 30.03</td><td>GM: G-SRT.C.8</td></tr>
<tr><td>32</td><td>1</td><td>30 or 31</td><td>GM: G-GMD.A.3</td></tr>
<tr><td>33</td><td>1</td><td>A, B, E, F</td><td>GM: G-CO.A.3</td></tr>
<tr><td>34</td><td>1</td><td>B, F</td><td>GM: G-GMD.A.1</td></tr>
<tr><td>35</td><td>1</td><td>A, D</td><td>GM: G-SRT.C.6</td></tr>
<tr><td>36</td><td>2</td><td>Part A: 12
Part B: 12.7 or 12.8</td><td>LEAP.I.GM.2
GM: G-GPE.B.7
GM: G-MG.A.2</td></tr>
<tr><td>37</td><td>3</td><td>Part A: See Rubric
Part B: See Rubric</td><td>LEAP.III.GM.2
A1: A-CED.A</td></tr>
<tr><td>38</td><td>3</td><td>See Rubric</td><td>LEAP.III.GM.4
GM: G-SRT.B.5
GM: G-SRT.C.8</td></tr>
<tr><td>39</td><td>4</td><td>Part A: See Rubric
Part B: See Rubric</td><td>LEAP.II.GM.2
GM: G-CO.D.12
GM: G-CO.C.9</td></tr>
</table>

RUBRICS

<table>
<tr><th colspan="2">Task #12</th></tr>
<tr><th colspan="2">Part A</th></tr>
<tr><th>Score</th><th>Description</th></tr>
<tr><td>1</td><td>Student response includes the following element:
• Reasoning component = 1 point
o Correct coordinates of point Q in terms of a, b, and c.

Sample Student Response:
$(2a + 2b, 2c)$ or equivalent
Note: Students are not required to show work, but will not be penalized for showing work.</td></tr>
<tr><td>0</td><td>Student response is incorrect or irrelevant.</td></tr>
<tr><th colspan="2">Part B</th></tr>
<tr><th>Score</th><th>Description</th></tr>
<tr><td>2</td><td>Student response includes each of the following 2 elements:
• Reasoning component = 2 point
o Student states that the midpoint of $\overline{SQ}$ must be the same as the midpoint of $\overline{PR}$
o Provides evidence using appropriate mathematical strategies, reasoning, and/or approaches that verifies $\overline{SQ}$ and $\overline{PR}$ bisect each other

Sample Student Response:
$\overline{SQ}$ bisects $\overline{PR}$ and $\overline{PR}$ bisects $\overline{SQ}$.
I know this because the midpoint of $\overline{SQ}$ has the same coordinates as the midpoint of $\overline{PR}$, as shown.
midpoint of $\overline{SQ}$ = $\left(\frac{0+2a+2b}{2}, \frac{0+2c}{2}\right) = \left(\frac{2a+2b}{2}, \frac{2c}{2}\right) = (a+b, c)$

midpoint of $\overline{PR}$ = $\left(\frac{2a+2b}{2}, \frac{0+2c}{2}\right) = \left(\frac{2a+2b}{2}, \frac{2c}{2}\right) = (a+b, c)$

Since the point of intersection of $\overline{SQ}$ and $\overline{PR}$ is the midpoint of both segments, $\overline{SQ}$ and $\overline{PR}$ bisect each other.</td></tr>
<tr><td>1</td><td>Student response includes 1 of the above elements.</td></tr>
<tr><td>0</td><td>Student response is incorrect or irrelevant.</td></tr>
</table>

<table>
<tr><th colspan="2">Task #13</th></tr>
<tr><th colspan="2">Part A</th></tr>
<tr><th>Score</th><th>Description</th></tr>
<tr><td>2</td><td>Student response includes the following 2 elements.
Modeling component = 1 point
Valid explanation or work to calculate the height of the support
Computation component = 1 point
Correct height of the support at 1.7 feet
Sample Student Response:
Let x represent the height of the support. A right angle is formed with a 25° angle and a hypotenuse of 4. A possible equation and solution: $\frac{x}{4} = \sin 25$; $x \approx 1.7$ ft.</td></tr>
<tr><td>1</td><td>Student response includes 1 of the 2 elements.</td></tr>
<tr><td>0</td><td>Student response is incorrect or irrelevant.</td></tr>
<tr><th colspan="2">Part B</th></tr>
<tr><th>Score</th><th>Description</th></tr>
<tr><td>1</td><td>Student response includes the following element.
Modeling component = 1 point
Valid model and height for Point Q.
Sample Student Response:
I can draw a line continuation of line segment QS from point Q to the ground creating a right triangle. The distance from point Q to where the hypotenuse of the right triangle touches the ground can be represented as y. Therefore, the hypotenuse from point R to the ground could be represented by 4 + y. $\cos 80 = \frac{1.7}{4+y}$; so, $y \approx 5.79$. From there, I will let the distance from point Q to the ground be represented by z. $\cos 80 = \frac{z}{5.79}$; so, $z \approx 1.005$. Therefore, the distance from point Q to the ground is approximately 1.0 foot.
Or:
The angle created by the seating board and the left side of the central support is 80°. I can draw a perpendicular line from point Q to the central support, RT, creating a right triangle. The distance from point Q to the ground is the same as the distance from the newly drawn line to the ground. Let y represent that distance. Then the distance along the central support from the drawn line to point T can be represented by 1.7 – y. $\cos 80 = \frac{1.7-y}{4}$; so, $y \approx 1.0$ ft. Therefore, the distance from point Q to the ground is approximately 1.0 foot.

Note: Without support, an answer of 1 foot does not earn any credit. A logical explanation of how to arrive at the height of Point Q from the ground with the correct answer of 1 foot is necessary to earn the point for part B. The modeling setup and work needs to show understanding of the process, but may contain some vague statements and minor errors.</td></tr>
<tr><td>0</td><td>Student response is incorrect or irrelevant.</td></tr>
</table>

Task #24	
Part A	
Score	**Description**
3	Student response includes each of the following 3 elements: • **Modeling component** = 2 points o Correct identification of the shape of the exposed surface as a rectangle o Correct and complete work shown to find the area • **Computation component** = 1 point o Correct area of the rectangle, 141 square inches Sample Student Response: The shape of the exposed surface is a rectangle. The width of this rectangle is the length of one edge of the cube, which is 10 inches. The length of the rectangle, *d,* is the length of the diagonal of a square face of the cube. To find this length, apply the Pythagorean Theorem. $d^2 = 10^2 + 10^2 = 200$; so, $d = \sqrt{200} \approx 14.1$ inches. The length of the diagonal of a face of the cube is approximately 14.1 inches. The area of the rectangle (exposed surface) is $10\sqrt{200} \approx 141$ square inches.
2	Student response includes 2 of the above 3 elements.
1	Student response includes 1 of the above 3 elements.
0	Student response is incorrect or irrelevant.
Part B	
Score	**Description**
3	Student response includes each of the following 3 elements: • **Computation component** = 2 points o Correct volume of clay in the chunk, 500 cubic inches o Correct volume of each clay sphere, $\frac{32}{3}\pi$ cubic inches, or approximately 33.5 cubic inches • **Modeling component** = 1 point o Correct conclusion that Daniel can make 14 clay spheres, with calculations to support that conclusion. Sample Student Response: The volume of each congruent chunk is half the volume of the entire block. The volume of the cube is (10 inches)^3, or 1,000 cubic inches. So the volume of each congruent chunk of clay is 500 cubic inches. Each sphere will have a diameter of 4 inches and a radius of 2 inches. The volume of each clay sphere will be $\frac{4}{3}\pi$ (2 inches)^3, or $\frac{32}{3}\pi$ cubic inches. This is approximately 33.5 cubic inches. To find the number of spheres that Daniel can make from the chunk of clay, divide the volume of the full chunk of clay, by the volume of one sphere: $500 \div 33.5 \approx 14.9$. The result of 14.9 means that there is enough clay in the chunk to make 14 clay spheres because there is not enough clay to make 15 complete spheres.
2	Student response includes 2 of the above elements.
1	Student response includes 1 of the above elements.
0	Student response is incorrect or irrelevant.

<table>
<tr><th colspan="2">Task #25</th></tr>
<tr><th colspan="2">Part A</th></tr>
<tr><th>Score</th><th>Description</th></tr>
<tr><td>3</td><td>Student response includes each of the following 3 elements:
Computation component = 1 point
Determination that BE = 16 and DE = 16
Reasoning component = 2 points
Correct and complete algebraic reasoning
Recognition of an extraneous solution
Sample Student Response:
Because the figure is a parallelogram, the diagonals bisect each other.
$x^2 - 48 = 2x$
$x^2 - 2x - 48 = 0$
$(x - 8)(x + 6) = 0$
$x = 8$ or $x = -6$
$x = -6$ is not possible because $2x$ would equal -12 and length is not negative.
So $x = 8$, $BE = 8^2 - 48 = 16$, and $DE = 2(8) = 16$
Notes:
If the student makes and error in writing the equation and gets two answers that work, the student must show both solutions to earn the second point.
If the student makes a computation error and finds that the diagonals are not congruent, the third reasoning point can be earned if the student concludes that the figure is not a rectangle.</td></tr>
<tr><td>2</td><td>Student response includes 2 of the above elements.</td></tr>
<tr><td>1</td><td>Student response includes 1 of the above elements.</td></tr>
<tr><td>0</td><td>Student response is incorrect or irrelevant.</td></tr>
<tr><th colspan="2">Part B</th></tr>
<tr><th>Score</th><th>Description</th></tr>
<tr><td>1</td><td>Student response includes the following element:
Reasoning component = 1 point
Explanation of why the parallelogram is a rectangle or that diagonals are congruent.
Sample Student Response:
ABCD is a rectangle. Because the lengths AE, BE, CE, and DE are all equal to 16, the diagonals are congruent and parallelogram ABCD is a rectangle.</td></tr>
<tr><td>0</td><td>Student response is incorrect or irrelevant.</td></tr>
</table>

<table>
<tr><th colspan="2">Task #37</th></tr>
<tr><th colspan="2">Part A</th></tr>
<tr><th>Score</th><th>Description</th></tr>
<tr><td>1</td><td>Student response includes the following element.
Modeling component = 1 point
Defining the variable and setting up the equation
Sample Student Response:
$w(w + 20) + 1{,}280 = (w + 16)(w + 20)$, where w is the width of the queen-sized mattress
OR
$16(w + 20) = 1{,}280$, where w is the width of the queen-sized mattress

Notes:
The variable must be defined or the point cannot be awarded.
Student should receive credit for any valid model written in terms of length.
The student can use of equation for the area of the king-sized mattress, such as $A = (w + 16)(w + 20)$, as long as the variable is defined.</td></tr>
<tr><td>0</td><td>Student response is incorrect or irrelevant.</td></tr>
<tr><th colspan="2">Part B</th></tr>
<tr><th>Score</th><th>Description</th></tr>
<tr><td>2</td><td>Student response includes the following 2 elements.
Modeling component = 1 point
Correct and complete work
Computation component = 1 point
Correct dimensions for both mattress, queen-sized: 60 inches by 80 inches, king-sized: 76 inches by 80 inches
Sample Student Response:
$w(w + 20) + 1{,}280 = (w + 16)(w + 20)$
$w^2 + 20w + 1{,}280 = w^2 + 36w + 320$
$960 = 16w$
$w = 60$
The width of the queen-sized mattress is 60 inches. The length is found by adding 20 inches, which gives 80 inches. Queen-sized: 60 in. x 80 in. The length of the king-sized mattress is the same as the queen-sized mattress (80 inches). The width is found by adding 16 inches, which gives 76 inches. King-sized: 76 in. x 80 in.

Note: The student can earn points for Part B if the student correctly solves an incorrect equation from Part A.</td></tr>
<tr><td>1</td><td>Student response includes 1 of the 2 elements.</td></tr>
<tr><td>0</td><td>Student response is incorrect or irrelevant.</td></tr>
</table>

Task #38	
Score	**Description**
3	Student response includes each of the following 4 elements: • **Computation component** = 1 point o Determines the value of the *x* to be about 16 feet • **Modeling component** = 2 points o Creates a valid equation o States assumptions needed to use the equation o Correct and complete work shown Sample Student Response: There is an assumption that the two triangles (the one formed by the billboard and the one formed by the post) are similar and very close to right triangles. $\frac{x}{26} = \frac{4}{\sqrt{4^2 + 5^2}}$ $x = 26\left(\frac{4}{\sqrt{41}}\right)$ $x \approx 16.24$ **OR** Let *y* be the angle formed by the support and the ground. Then, $y = \cos^{-1}\left(\frac{4}{\sqrt{41}}\right)$, and $x = 26\cos y$. **Note:** Any intermediate rounding should also result in an answer of about 16. **Note about assumptions:** There is no indication in the description that the triangles are right triangles, although the figure certainly suggests it. Possible assumptions should address this if the Pythagorean theorem or the cosine function is used, such as: • There is an assumption that the billboard and the post are both perpendicular to the ground and that the ground is level; or • There is an assumption that the billboard and the post are parallel and very nearly perpendicular to the ground, and that the ground is level.
2	Student response includes 3 of the above elements.
1	Student response includes 1 or 2 of the above elements.
0	Student response is incorrect or irrelevant.

<table>
<tr><th colspan="2">Task #39</th></tr>
<tr><th colspan="2">Part A</th></tr>
<tr><th>Score</th><th>Description</th></tr>
<tr><td>2</td><td>• Reasoning component = 2 points
o Student response includes accurate instructions for steps 2-5.

Sample Student Response:
For step 2, draw any arc centered at point Z. Label the intersections of the arc and the angle point A and point B. For step 3, draw any arc with a radius greater than half of $\angle BZA$ centered at point A. For step 4, draw an arc centered at point B with the same radius as the arc used in step 3. Label the intersection of the arcs from step 3 and 4 point C. For step 5, draw a ray through point C with an end point at Z.</td></tr>
<tr><td>1</td><td>Student response includes accurate instructions for a least two of the steps based on descriptions to previous steps.</td></tr>
<tr><td>0</td><td>Student response is incorrect or irrelevant.</td></tr>
<tr><th colspan="2">Part B</th></tr>
<tr><th>Score</th><th>Description</th></tr>
<tr><td>2</td><td>Student response includes a full explanation of each of the following 2 elements:
• Reasoning component = 2 points
o A logical sequence of reasons and statements that constitute a valid mathematical explanation or proof

Sample Student Response:
1. $\overline{AZ} \cong \overline{BZ}$ and $\overline{AC} \cong \overline{BC}$
Both segments were drawn with the same compass setting, and all radii of a given circle are congruent.
2. $\overline{ZC} \cong \overline{ZC}$
Reflexive Property of Congruence
3. $\Delta AZC \cong \Delta BZC$
Side-Side-Side Triangle Congruence
4. $\angle AZC \cong \angle BZC$
Corresponding parts/angles of congruent triangles are congruent.
5. $\overline{ZC}$ bisects $\angle AZB$
definition of angle bisector</td></tr>
<tr><td>1</td><td>Student response includes a partial explanation.</td></tr>
<tr><td>0</td><td>Student response is incorrect or irrelevant.</td></tr>
</table>