Directions

- Read all the directions for each question carefully and think about the answer.

- This Assesslet contains five items. Questions 1 and 2 are selected-response items where you choose the one BEST answer. Answer each question by filling in the circle on your answer document.

- Questions 3 and 4 are constructed-response items. Use the scratch paper provided to plan your response. Write your answer(s) on the lines provided on your answer document.

- Question 5 is an extended-response item. Use the scratch paper provided to plan your response. Write your answer(s) on the lines provided on your answer document.

- Be sure to write your answers in the spaces provided on the answer document.
Item 1

In the grid below, each unit represents a square with 1 inch sides.

What is the total area of the space outside the polygon above?

A 63 square inches
B 66 square inches
C 67 square inches
D 68 square inches
Item 2

The following figure represents the design for a box.

Based on the dimensions above, how many whole boxes of this design could be placed in a room with a volume of 5 1/2 cubic feet (ft³)?

A  8 boxes  
B  9 boxes  
C  10 boxes  
D  14 boxes
Item 3

Farmer John wants students to see the animals on his farm. He plans to place his cows in a square section measuring 110 meters on each side. He also plans to place his pigs in a parallelogram section with a base length of 60 meters and a height of 110 meters. The students will view the animals in a triangular section whose base is perpendicular to the side of the cow section. The figure below shows his proposed design.

If Farmer John’s field has a total area of 10000 square meters for the animals, and he wants a square section with 110 square meters, is enough space for a viewing section? Explain whether or not the farmer can build space based on the design above.

Write your answer on your answer document.
Item 4

Use the table below to answer the following questions:

<table>
<thead>
<tr>
<th>x-coordinate</th>
<th>y-coordinate</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Part A**
On your answer document, sketch a graph to plot the coordinates and connect the points by drawing a line that goes through each point only once. Identify the polygon you have drawn.

**Part B**
What is the area of the figure you have drawn? Write your answer on your answer document. Part A? Explain the strategy that you have used to find the area. Please describe how you calculated the area.
Item 5

The company Boxes for Books wants you to design a cardboard box to hold their books. Your design must consider the following specifications:

- Each book is a right rectangular prism with a length of 10 in., width of 6 in., and height of 4 in.
- The books will be stacked on top of each other inside the center of the box with at least 1 in. of space between the books and each side of the box, including the bottom of the box.

Part A
What is the volume of a right rectangular prism that can hold all 15 books if there is 1 in. of space between the books and each side of the box? Show your work. Write your answer on your answer document.

Part B
Boxes for Books has proposed a right triangular pyramid as an alternative design for a box. This new design has a square base with a surface area of 37.18 square inches. The length of each side of the base is 5 in. and the height of the triangles attached to the sides is 4 in. Find the height of the vertex of the right triangular pyramid and draw this as a two-dimensional polygon net on a coordinate plane.

Part C
The floor of a public library room is a square with an area of 1000 square feet. The library needs a box design that allows for the MOST number of boxes on the floor of the room. Which of the box designs from Part A and Part B allow the library to keep the MOST boxes in the room without stacking any of the boxes? Show your work.