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  80 square inches
Item 2

The following figure represents the design for a box.

![Box diagram]

Based on the dimensions above, how many whole boxes of this design could be placed in a room with a volume of $5\frac{1}{2}$ cubic feet ($\text{ft}^3$)?

A. 8 boxes  
B. 9 boxes  
C. 13 boxes  
D. 14 boxes
Farmer John wants students to see the animals on his farm. He plans to place his cows in a square section measuring 50 meters on each side. He also plans to place his pigs in a parallelogram section with a side length of 40 meters and a height of 16 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 3000 square meters for the animals, and he wants a viewing section with 100 square meters of space, how can he determine if there is enough room for a viewing section? Explain whether or not the farmer can build a viewing section with 100 square meters of 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>-3</td>
</tr>
<tr>
<td>-3</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>-3</td>
</tr>
</tbody>
</table>

Part A
On your answer document, sketch a graph to plot the coordinates and connect the dots 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 in Part A? Explain the strategy that you have used to find the area. Write your answer on your answer document.
The company Boxes for Books wants you to design a cardboard box to hold five books. Your design must consider the following specifications:

- Each book is a right rectangular prism with a 1 in. height, 6 in. length, and 4 in. width.
- The books will be stacked on top of each other inside the center of the box with at least ¼ inch of space between the books and each side of the box, excluding the bottom of the box.

**Part A**
What is the volume of a right rectangular box that can hold all 5 books if there is ¼ 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 42.25 square inches. The height of each of the triangles attached to the sides of the base is 4 inches. Boxes for Books wants you to draw this new design in a coordinate plane with one vertex of the base at (3, 4). Find the lengths, in inches, for each side of this new design and draw this right triangular pyramid 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 that room. Which of the box designs from Part A and Part B will allow the library to keep the **MOST** boxes in the room without stacking any of the boxes? Show your work.