46. Kelsey draws a series of right triangles with sides that have the lengths shown in the table below.

### Lengths of Sides of Kelsey’s Right Triangles (inches)

<table>
<thead>
<tr>
<th>Triangle</th>
<th>Length of First Leg</th>
<th>Length of Second Leg</th>
<th>Length of Hypotenuse</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>1</td>
<td>$\sqrt{2}$</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td>2</td>
<td>$\sqrt{5}$</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td>3</td>
<td>$\sqrt{10}$</td>
</tr>
<tr>
<td>D</td>
<td>1</td>
<td>4</td>
<td>$\sqrt{17}$</td>
</tr>
<tr>
<td>E</td>
<td>1</td>
<td>5</td>
<td>$\sqrt{26}$</td>
</tr>
</tbody>
</table>

**A.** Plot and label each of the five hypotenuse lengths on the number line shown below.

```
0 1 2 3 4 5 6 7 8 9 10
```

The next hypotenuse in the pattern is $\sqrt{37}$. Kelsey plots $\sqrt{37}$ on a number line without the use of a calculator.

**B.** Explain how Kelsey could find between which two consecutive whole numbers she should plot $\sqrt{37}$. Also explain how she can determine to which of these two whole numbers $\sqrt{37}$ is closest.

Go to the next page to finish question 46.
46.  **Continued.** Please refer to the previous page for task explanation.

Kelsey continues making right triangles following the same pattern she used to make the first five right triangles.

**C.** Explain why none of the right triangles Kelsey makes will have a hypotenuse with a rational number length.
SECOND OPEN-ENDED QUESTION

B-E.1

47. Fiona is making her own checkers game set.

The area of the square game board she makes is 256 square inches.

A. What is the length, in inches, of one side of the game board?

Fiona cuts out checkers pieces from sheets of construction paper that are each 0.0063 inch thick.

B. What is the thickness, in inches, of one checkers piece, written in scientific notation?

Go to the next page to finish question 47.
Fiona plans to make a box in the shape of a rectangular prism for storing the checkers pieces. The box will have a square base and a volume of 8 cubic inches. She wants the smallest dimension to be at least 1 inch. She comes up with two different designs for the box. One of the designs has dimensions of 1 inch by 1 inch by 8 inches.

C. What could be the dimensions, in inches, of Fiona’s other box? Why does this meet Fiona’s requirements? (Hint: The volume of a rectangular prism is \( l \times w \times h \).)
50. The scatter plot below shows the results of a survey of 16 people. They were asked how many days per week they eat breakfast and how many days per week they go to the gym.

Eating Breakfast and Going to the Gym Each Week

A. What are the coordinates of the point that is the outlier of the data? Explain what the point represents.

Go to the next page to finish question 50.
50. **Continued.** Please refer to the previous page for task explanation.

Jeff drew a line through (0, 0) and (7, 7) and said it was the line of best fit for the data.

**B.** Explain why Jeff’s line is **not** a line of best fit.

**C.** How does the actual line of best fit compare with Jeff’s line?