Dog Days of Summer Exploration Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1) Use your unit squares to build all possible rectangles that have a perimeter of 18.

 a) Draw a picture of your rectangles on the grids below.

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 b) Complete the table below. It will be helpful if your list your lengths in sequential order.

|  |  |  |
| --- | --- | --- |
| Length | Width | Area |
|  |  |  |
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 c) What length and width produces the rectangle with the greatest area?

2) Use your unit squares to build all possible rectangles that have a perimeter of 30.

 a) Complete the table below. It will be helpful if your list your lengths in sequential order.

|  |  |  |
| --- | --- | --- |
| Length | Width | Area |
|  |  |  |
|  |  |  |
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b) What length and width produces the rectangle with the greatest area?

3) Use your unit squares to build all possible rectangles that have a perimeter of 24.

 a) Complete the table below. It will be helpful if your list your lengths in sequential order.

|  |  |  |
| --- | --- | --- |
| Length | Width | Area |
|  |  |  |
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 b) What length and width produces the rectangle with the greatest area?

4) Graph the values from your 3 tables on the graph below. Use the ordered pair (Length, Area). Use a different color for each of the 3 perimeters.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 58 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 56 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 54 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 52 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 50 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 48 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 46 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 44 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 42 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 40 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 38 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 36 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 34 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 32AREA |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 30 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 28 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 26 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 24 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 22 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 20 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 18 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 16 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 14 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 12 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 10 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

 LENGTH

5) Describe the graphs. What do all of the rectangles with the largest area have in common?

6) If you were to use fractional widths and lengths, could you build a larger rectangle with a perimeter of 30? Explain.