Exploration:

**How Strong is Spaghetti?**

**Objective:** To find a linear function that fits a set of real world data.

**Procedure:**

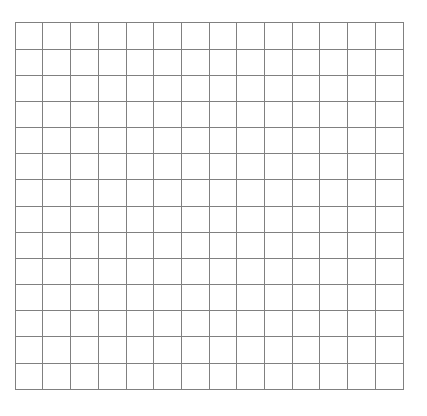
1. Puncture two holes in the top of the cup and thread a string through the holes. Tie the ends of the string together so that the string acts like a handle.
2. Place one piece of spaghetti under the string so that the cup hangs from the middle of the piece of spaghetti. One person should hold both ends of the spaghetti.
3. Another person should begin to add pennies to the cup. When the spaghetti breaks, record the number of pennies needed to break the spaghetti.
4. After you have broken one piece of spaghetti, use two new pieces and again place pennies in the cup until the spaghetti breaks. Repeat the experiment until the table below is completed.

**Data Table and Exploration:**

1. Complete the table below based on your experiments.

|  |  |
| --- | --- |
| Pieces of Spaghetti | **Number of Pennies Needed** |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |

2. Graph your results on graph paper. Use the pieces of spaghetti on the x-axis and the number of pennies on the y-axis. Remember to label your axes and scale on the graph.



3. Describe what you see on your graph.

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4. Graphs can be used to estimate a value beyond a given set of values. This is known as **EXTRAPOLATION**. Using your graph above, estimate the amount of pennies needed to break the pieces of spaghetti.

|  |  |
| --- | --- |
| Pieces of Spaghetti | **Number of Pennies Needed** |
| 10 |  |
| 14 |  |

5. When we estimate a value between two given values it is called **INTERPOLATION**. Interpolation should only be used when it makes sense to have values between given values. Predict the number of coins necessary if one and a half pieces of spaghetti is used? Is this estimated number meaningful, why or why not?

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6. Is it meaningful to connect the points on this graph? Why or why not?

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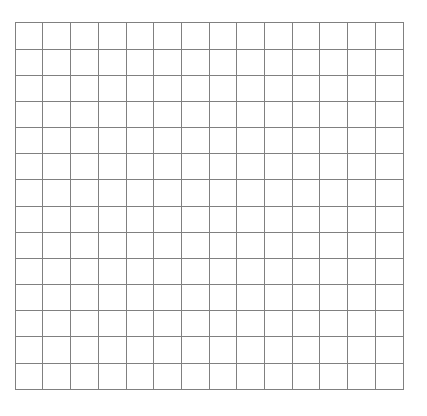
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Problem Set # 3

1. Graph the linear relation y = 2x -5.



|  |  |
| --- | --- |
| x | y |
| 0 |  |
| 1 |  |
| 2 |  |
| 3 |  |





Is it meaningful to connect the points on this graph? Why or why not?

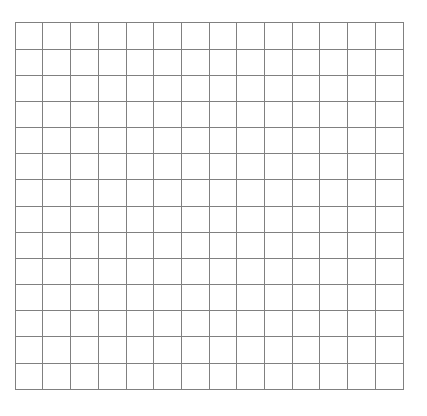


Problem Set # 4

1. Andrea is travelling by bus at an average speed of 85 km/hr. The equation relating distance, d, and time, t, is d = 85t. Show the relationship on a graph.



|  |  |
| --- | --- |
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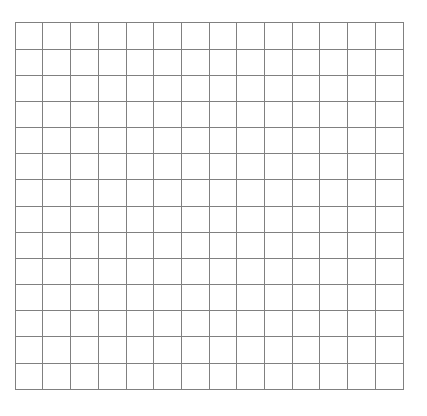


How long does it take Andrea to travel 300 km?



1. Create a table of values and a graph for each linear equation.





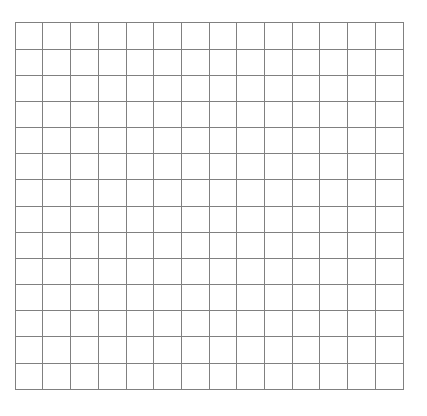


1. y = 4

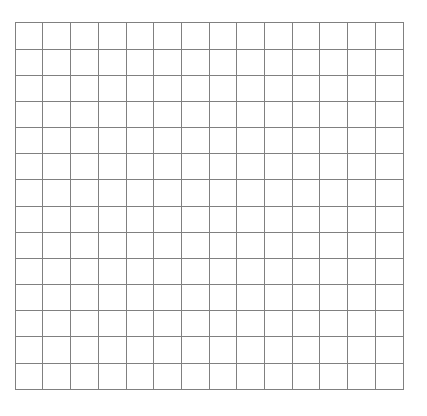


1. r = -3x + 4.5





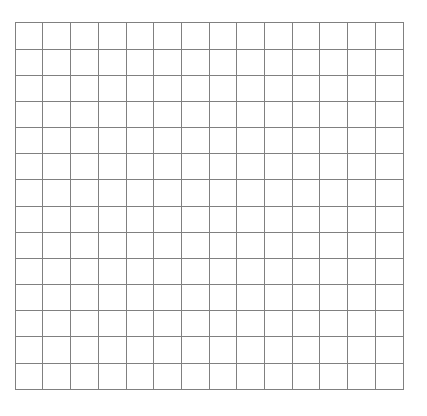


1. m = x + 4



3. Create a graph and a linear equation to represent the following table of values.

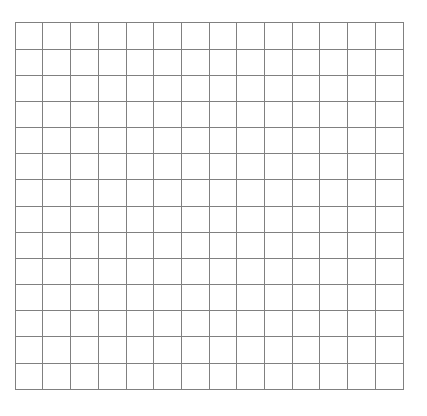


 a.

|  |  |
| --- | --- |
| x | y |
| -2 | -7 |
| -1 | -4 |
| 0 | -1 |
| 1 | 2 |
| 2 | 5 |
| 3 | 8 |



|  |  |
| --- | --- |
| x | y |
| -3 | -3 |
| -2 | -2 |
| -1 | -1 |
| 0 | 0 |
| 1 | 1 |
| 2 | 2 |





b.

