

## Problem 2.1

**Standard form of a line  $y=mx + b$**

**y is dependent variable**

**x is independent variable**

**M is slope/pattern in table/constant rate of change**

**B is the y intercept/starting point**

### **Part A**

1. Write an equation for the line on page 25. \_\_\_\_\_
2. Use the line on page 25 or the equation above to estimate the painting costs for a bridge that is
  - 175 feet long
  - 280 feet long
3. Use the line on page 25 or the equation above to estimate the lengths for a bridge that costs
  - \$10,000
  - \$60,000

### **Part B**

1. First State Bridge-Painting Costs

Bridge Number	Length	Cost
3	150	\$50,000
4	300	\$80,000
5	500	\$140,000

On the graph below plot these points. Draw a line that models the pattern in the data points.

2. Write an equation for this line. \_\_\_\_\_
3. Use your line or equation to estimate the painting cost for a bridge that is 200 feet.  
\_\_\_\_\_
4. Use your line or equation to estimate the length of a bridge that cost \$100,000 to paint. \_\_\_\_\_

2.

3. As the number of steps increase, the number of rods change by \_\_\_\_\_  
\_\_\_\_\_
4. You can see this pattern in the table by \_\_\_\_\_  
You can see this pattern in the graph because \_\_\_\_\_
5. A staircase with 12 steps would have \_\_\_\_\_ steel rods.

**Part C**

Thinking with Mathematical Models

The pattern in A is similar to the pattern in B

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The pattern in A is different from the pattern in B

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**Part D**

The beam and bridge-thickness relationships are both \_\_\_\_\_

The bridge-length and staircase relationships are both \_\_\_\_\_

**Part C**

Is the relationship between bridge thickness and breaking weight linear or non-linear?

Thinking with Mathematical Models

In the table you can see this because \_\_\_\_\_

In the graph you can tell because \_\_\_\_\_

**Part D**

Bridge Length	Number of coins
3	
5	
10	
12	

**Part E**

The bridge thickness and length experiments are the same because

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The bridge thickness and length experiments are different because

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