

# Warm Up

11/20

Below is a table of data. Is it linear or exponential?

| x | y   |
|---|-----|
| 0 | 10  |
| 1 | 30  |
| 2 | 90  |
| 3 | 270 |

+1 < > +20  
+1 < > +60  
+1 < > +180

If it is exponential, how do we find the growth factor?



$$\frac{\Delta y}{\Delta x} = \frac{20}{1} \neq \frac{60}{1} \neq \frac{180}{1}$$

Not Linear, there is no constant slope.

| x | y   |
|---|-----|
| 0 | 10  |
| 1 | 30  |
| 2 | 90  |
| 3 | 270 |

+1 < > x3  
+1 < > x3  
+1 < > x3

This is exponential because there is a constant Growth Factor.

This is the work expected when asked a question like this.

# Finding Growth Factors

Some growth factors are easy to find just by looking at the table.

| x | y   |
|---|-----|
| 3 | 2   |
| 4 | 10  |
| 5 | 50  |
| 6 | 250 |

$+1 <$   $> \times 5$   
 $+1 <$   $> \times 5$   
 $+1 <$   $> \times 5$

| x | y  |
|---|----|
| 3 | 3  |
| 4 | 6  |
| 5 | 12 |
| 6 | 24 |

$+1 <$   $> \times 2$   
 $+1 <$   $> \times 2$   
 $+1 <$   $> \times 2$

What if it's not that easy?

| x | y      |
|---|--------|
| 1 | 46     |
| 2 | 552    |
| 3 | 6624   |
| 4 | 79,488 |

multiplying  $\uparrow$   
 dividing

| x | y      |
|---|--------|
| 1 | 46     |
| 2 | 552    |
| 3 | 6624   |
| 4 | 79,488 |

$+1 <$   $> \times 12$   
 $+1 <$   $> \times 12$   
 $+1 <$   $> \times 12$

$$\frac{552}{46} = 12$$

$$\frac{6624}{552} = 12$$

$$\frac{79488}{6624} = 12$$

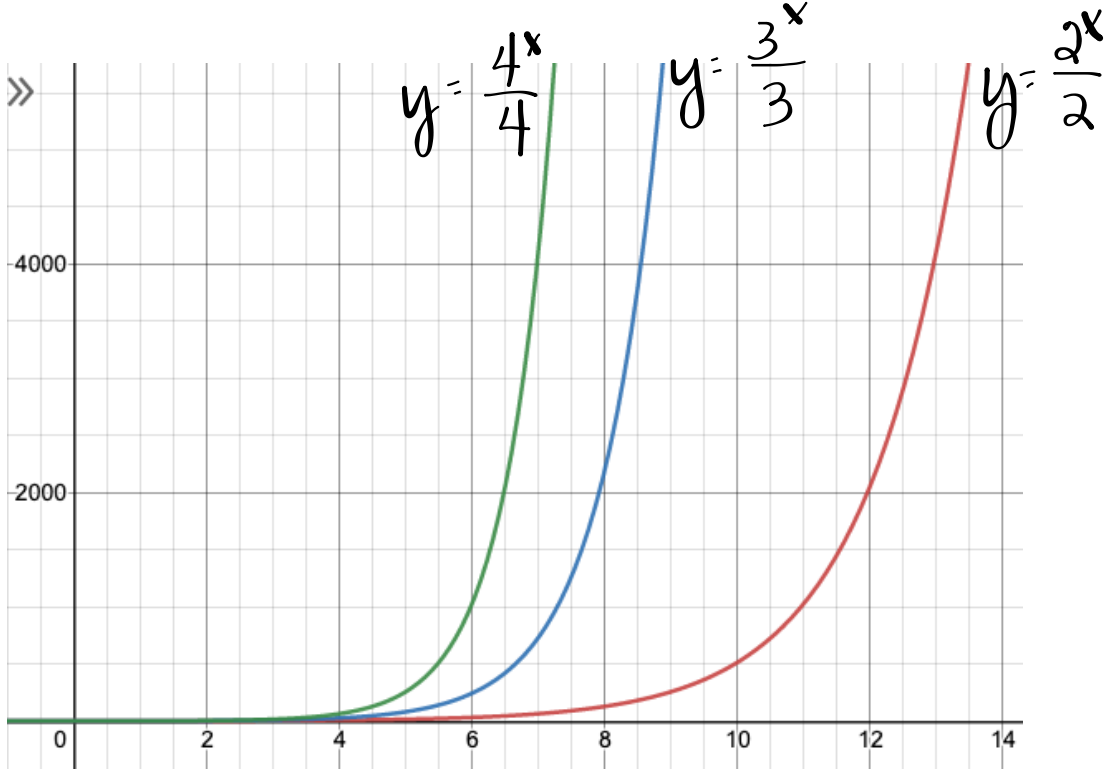
Constant Growth Factor

## Problem 1.3 Recap

$$y = \frac{2^x}{2} \quad y = \frac{3^x}{3} \quad y = \frac{4^x}{4} \quad y = 5x + 15$$

| Square Number | Number of Rubas |        |         |        |
|---------------|-----------------|--------|---------|--------|
|               | Plan 1          | Plan 2 | Plan 3  | Plan 4 |
| 1             | 1               | 1      | 1       | 20     |
| 2             | 2               | 3      | 4       | 25     |
| 3             | 4               | 9      | 16      | 30     |
| 4             | 8               | 27     | 64      | 35     |
| 5             | 16              | 81     | 256     | 40     |
| 6             | 32              | 243    | 1,024   | 45     |
| 7             | 64              | 729    | 4,096   | 50     |
| 8             | 128             | 2187   | 16,384  | 55     |
| 9             | 256             | 6561   | 65,536  | 60     |
| 10            | 512             | 19,683 | 262,144 | 65     |

It's exponential if "x" is the exponent!



## **Classwork**

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# Homework

Finish classwork