Lesson 4: Graphing Exponentials in the Form $y = b^x$

Determine the equation for each scenario given.

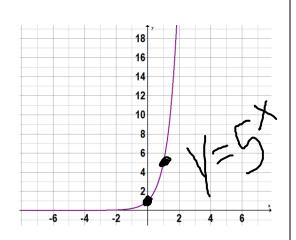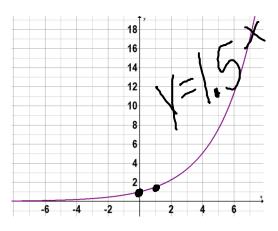1. My initial value is 1 and every time my x-value increases by 1, my y-value doubles.

$$y = 2^x$$

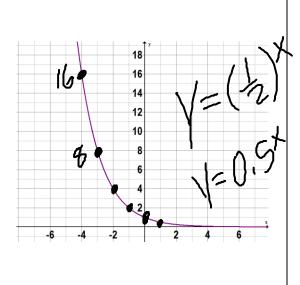2. My initial value is 1 and every time my x-value increases by 1, my y-value gets cut in half.

$$y = 0.5^x$$
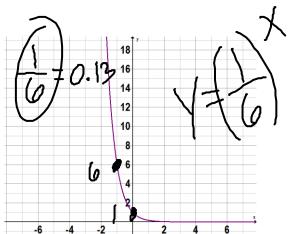
3. Here's my table, what's my equation?

$$y = 3^x$$

x	y
-2	$\frac{1}{9}$
-1	$\frac{1}{3}$
0	1
1	3
2	9

×3, ×3, ×3, ×3

x	y
-2	16
-1	4
0	1
1	0.25
2	0.065

÷4 or ×$\frac{1}{4}$ or × 0.25

$$y = 0.25^x \qquad y = \left(\frac{1}{4}\right)^x$$

x	y
-2	0.04
-1	0.2
0	1
1	5
2	25

×5

$$y = 5^x$$

x	y
-2	9
-1	3
0	1
1	$\frac{1}{3}$
2	$\frac{1}{9}$

0.3333333

$$y = \left(\frac{1}{3}\right)^x$$

$$y = 0.33^x$$

4. Here's my graph, what's my equation?

$y = 5^x$

$y = 1.5^x$

$y = \left(\frac{1}{2}\right)^x$

$y = 0.5^x$

16

8

$\left(\frac{1}{6} = 0.13\right)$

$y = \left(\frac{1}{6}\right)^x$

6

5. Here's my equation, make me a table of values!

$y = \left(\frac{1}{2}\right)^x$

x	y
-2	4
-1	2
0	1
1	0.5
2	0.25

$y = 4^x$

x	y
-2	0.0625
-1	0.25
0	1
1	4
2	16

$y = 0.4^x$

x	y
-2	6.25 ÷0.4
-1	2.5 ÷0.4
0	1
1	0.4 ×0.4
2	0.16