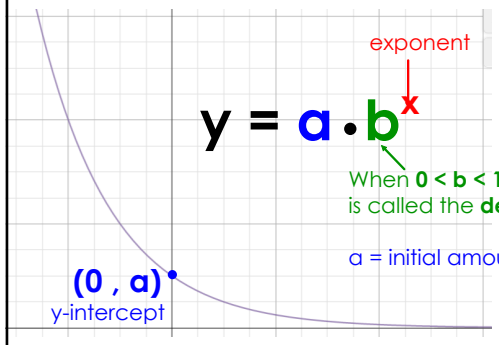
7.5 Exponential Decay



Recall: If **b > 1**, it is an exponential **growth** function.

Oct 28-2:44 PM

Determine if the function is exponential growth and decay. What is the y-intercept?

$y = 3 \cdot 0.34^x$ .34<1 decay y-int: (0,3)

$y = 5 \cdot 1.5^x$ 1.5>1 growth y-int: (0,5)

$y = (1/5)^x$ 1/5<1 decay y-int: (0,1)

Nov 4-8:34 AM

Identify the initial amount and decay factor in each exponential function.

a) $y = 5 \cdot (0.5)^x$

Initial amt: 5

decay factor: .5

b)

x	-1	0	1	2
y	16	4	1	.25

÷4 ÷4 ÷4

× 1/4 × 1/4 × 1/4

b = 1/4 a = 4

$y = 4 \cdot \frac{1}{4}^x$

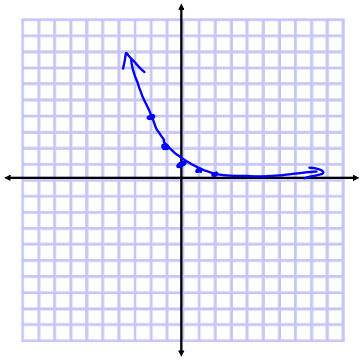
Apr 12-1:05 PM

Graphing Exponential Functions

- **make a table with x = -2,-1,0,1,2**

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

x	y
-2	4
-1	2
0	1
1	1/2
2	1/4

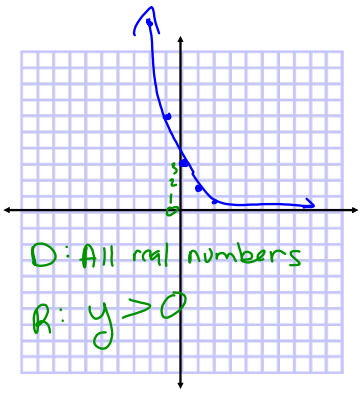


Apr 11-1:17 PM

Graph. Give the domain and range.

$y = 3 \cdot (\frac{1}{2})^x$

x	y
-2	12
-1	6
0	3
1	1.5
2	.75

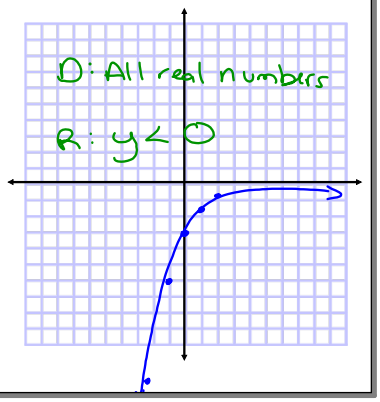


Apr 11-1:17 PM

Graph. Give the domain and range.

$y = -3 \cdot (\frac{1}{2})^x$

x	y
-2	-12
-1	-6
0	-3
1	-1.5
2	-.75

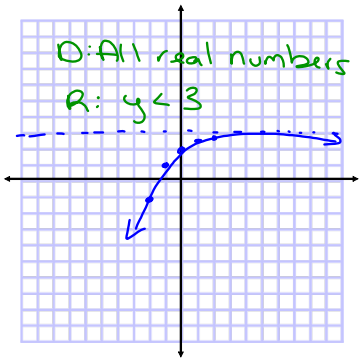


Apr 11-1:17 PM

Graph. Give the domain and range.

$y = -1 \cdot (\frac{1}{2})^x + 3$

x	y
-2	-1
-1	1
0	2
1	2.5
2	2.75



Apr 11-1:17 PM

How to write an exponential decay model.

1. Identify the initial amount (a)
2. Write the decay factor (b) as (1 - %)
3. Substitute these values into

$y = a \cdot b^x$

5% = .05
50% = .50
5.5% = .055

Oct 28-2:44 PM

Write an exponential decay model.

A business purchases a computer system for $3000. The value of the system **decreases** at a rate of 15% per year.

$a = 3000$

$b = 1 - 15\%$

$b = 1 - .15$

$b = .85$

$y = 3000 \cdot (.85)^x$

Apr 12-1:25 PM

The kilopascal is a unit of measure for atmospheric pressure. **The atmospheric pressure at sea level is 101 kilopascals.** For every 1000 meter increase in altitude, the pressure **decreases about 11.5%.**

A. Write an equation for the scenario

$a = 101$

$b = 1 - .115 = .885$

$y = 101 \cdot (.885)^x$

B. What is the approximate atmospheric pressure at 3000 meters? (how many "thousand" meters in 3000?")

$x = 3$

$y = 101(.885)^3$

70 kilopascals

Apr 15-8:11 AM

Classwork: **p.473 #4-40 (4's),48,50**

Copy the questions.

Final Five

The population of a city is 45,000 and decreases 2% each year. Write a model for the population change.

Apr 12-1:37 PM