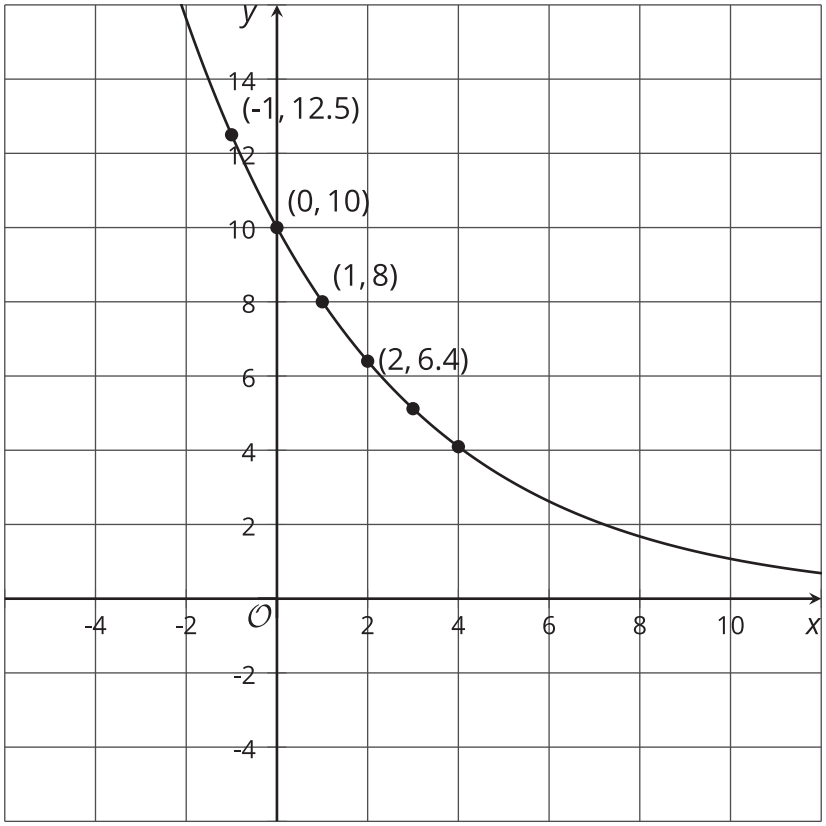
Unit 6, Lesson 16

Representations of Exponential Functions

Let's get information about a function from its graph.

16.1 Worked Example: What's the Line?

What is the equation for this graph?



Step 1:
This looks like an exponential equation, so it has a vertical intercept and growth factor.

Step 2:
The graph includes the point $(0, 10)$, which is the vertical intercept.

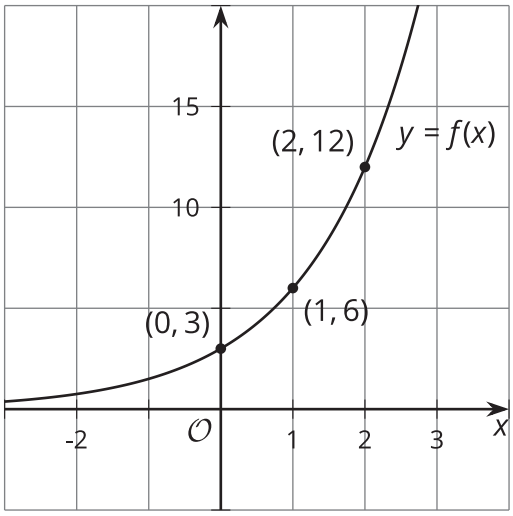
Step 3:
$8 \div 10 = 0.8$, $6.4 \div 8 = 0.8$, $10 \div 12.5 = 0.8$, the growth factor is 0.8.

Step 4:
The equation is $y = 10 \cdot 0.8^x$.

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16.2 Interrogating Function Representations

1. Consider the graph of $f(x) = 3 \cdot 2^x$ and the corresponding table.



x	$f(x)$
0	3
1	6
2	12

a. Using the first two points, what is the growth factor?

b. Using the second two points, what is the growth factor?

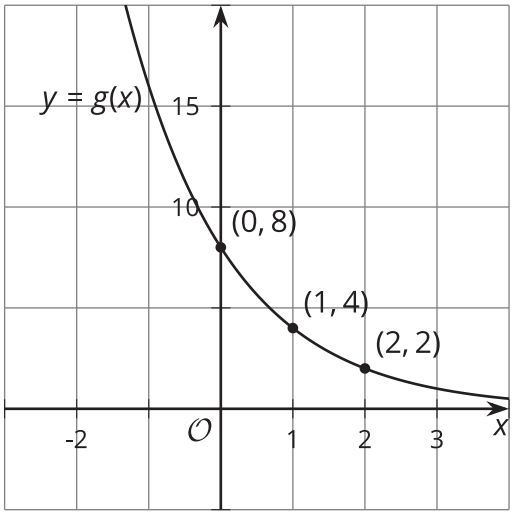
c. Where do you see this growth factor in the equation?

d. Where do you see the growth factor on the graph?

e. What is the vertical intercept of the graph?

f. How can you tell from the equation that this is the vertical intercept?

2. Consider the graph of $g(x) = 8 \cdot \left(\frac{1}{2}\right)^x$ and corresponding table.



x	$g(x)$
0	8
1	4
2	2

a. Using the first two points, what is the growth factor?

b. Using the second two points, what is the growth factor?

c. Where do you see this growth factor in the equation?

d. Where do you see the growth factor on the graph?

e. What is the vertical intercept of the graph?

f. How can you tell from the equation that this is the vertical intercept?

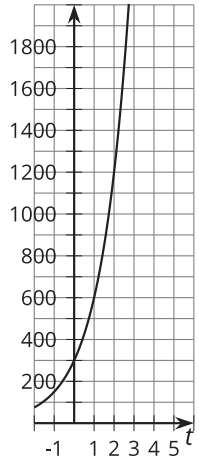
16.3 Matching Representations of Exponential Functions

1. Match each function with the graph that represents it.

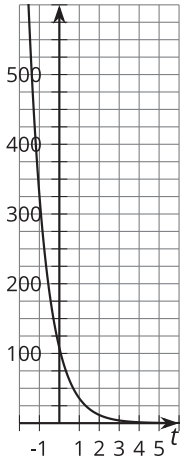
$a(t) = 300 \cdot 2^t$ $b(t) = 300 \cdot 3^t$ $c(t) = 300 \cdot \left(\frac{1}{2}\right)^t$ $d(t) = 300 \cdot \left(\frac{1}{3}\right)^t$

$e(t) = 108 \cdot 2^t$ $f(t) = 108 \cdot 3^t$ $g(t) = 108 \cdot \left(\frac{1}{2}\right)^t$ $h(t) = 108 \cdot \left(\frac{1}{3}\right)^t$

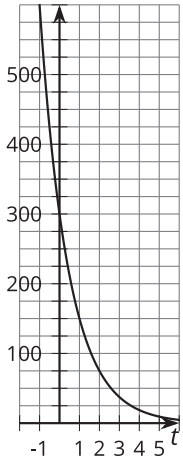
graph 1



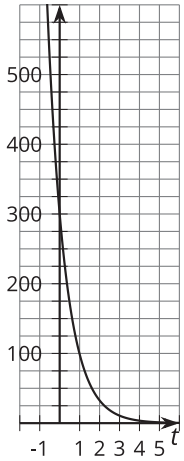
graph 2



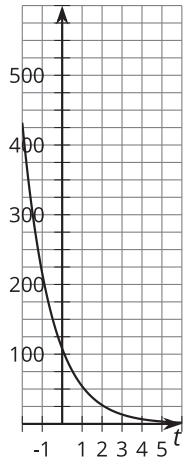
graph 3



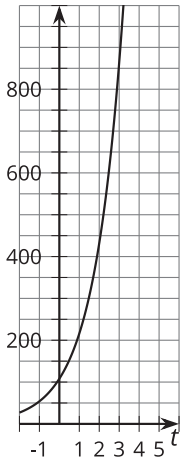
graph 4



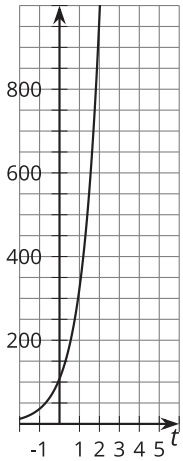
graph 5



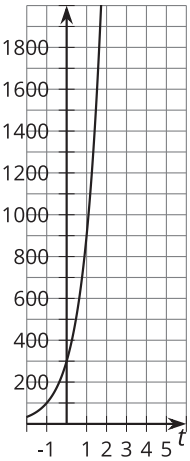
graph 6



graph 7



graph 8



2. On two of the graphs, show where you can see the vertical intercepts: 108 and 300.
3. On four of the graphs, show where you can see the growth factors: $\frac{1}{3}$, $\frac{1}{2}$, 2, and 3.