

Algebra 1 7.5
 Graph exponential functions
 Identify exponential behavior

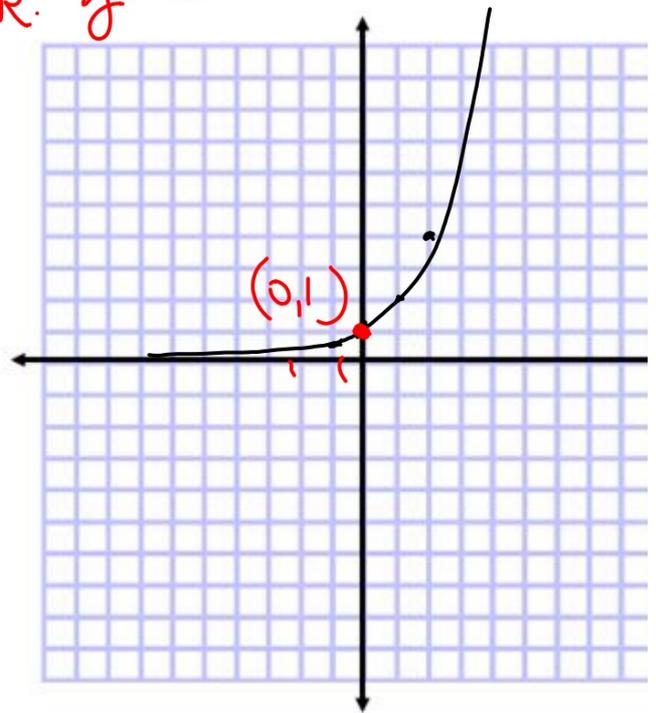
base
 exponent
 y-intercept
 rate of change
 linear
 exponential growth
 exponential decay

Activity: giant graphs

$$y = 2^x$$

0	2^0	1
1	2^1	2
2	2^2	4
-1	2^{-1}	$\frac{1}{2}$

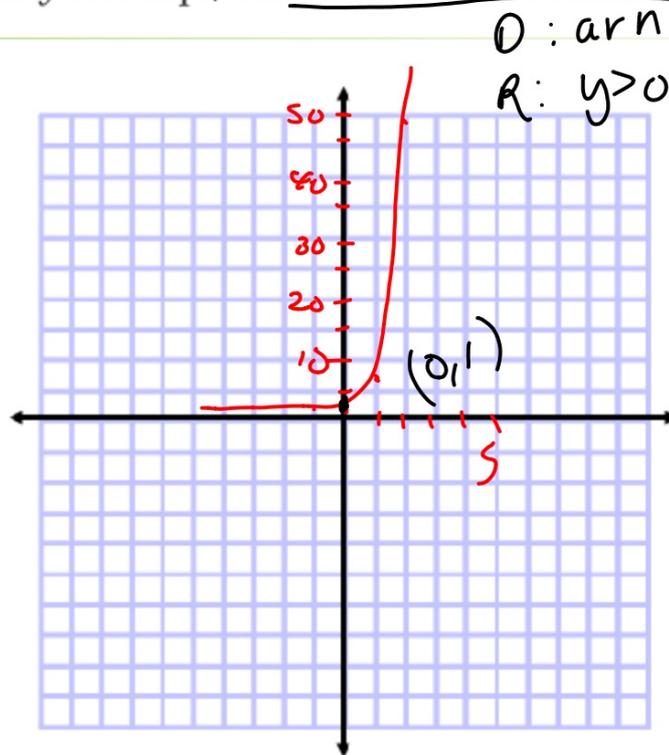
D: $AR\mathbb{N}$
 R: $y > 0$



Guided Practice

1. Graph $y = 7^x$. Find the y -intercept, and state the domain and range.

	7^x	
0	7^0	1
1	7^1	7
2	7^2	49
-1	7^{-1}	$\frac{1}{7}$

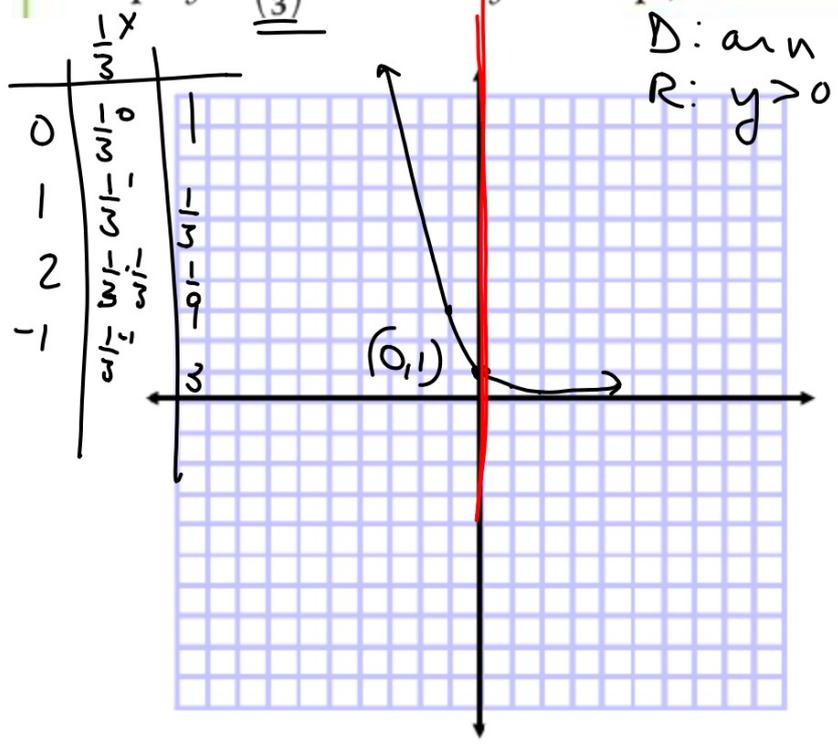


fraction

$3^{\frac{1}{2}}$

Example 2 Graph with $a > 0$ and $0 < b < 1$

Graph $y = \left(\frac{1}{3}\right)^x$. Find the y -intercept, and state the domain and range.



KeyConcept Graphs of Exponential Functions

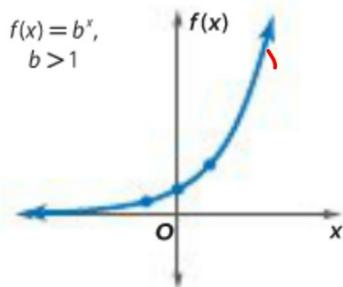
Exponential Growth Functions

Equation: $f(x) = ab^x$, $a > 0$, $b > 1$

Domain, Range: all reals; all positive reals

Intercepts: one y-intercept, no x-intercepts

End behavior: as x increases, $f(x)$ increases;
as x decreases, $f(x)$ approaches 0



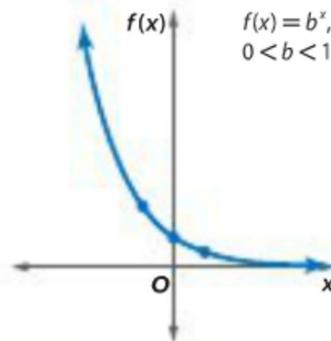
Exponential Decay Functions

Equation: $f(x) = ab^x$, $a > 0$, $0 < b < 1$

Domain, Range: all reals; all positive reals

Intercepts: one y-intercept, no x-intercepts

End behavior: as x increases, $f(x)$ approaches 0;
as x decreases, $f(x)$ increases





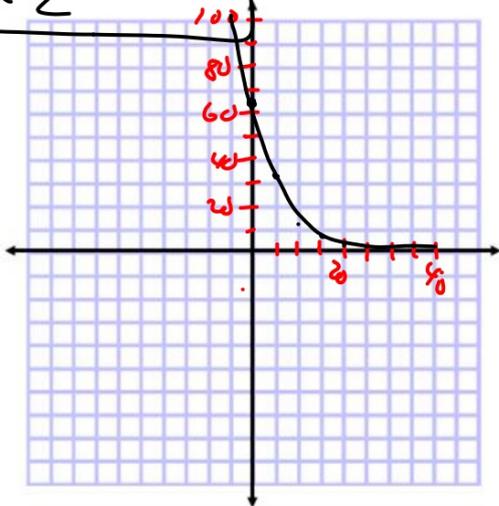
Example 4 Identify Exponential Behavior

Determine whether the set of data shown below displays exponential behavior. Write *yes* or *no*. Explain why or why not.

x	0	5	10	15	20	25
y	64	32	16	8	4	2

x	y
0	64
5	32
10	16
15	8
20	4
25	2

yes
mult. rule
 $\times \frac{1}{2}$



Is it a multiplying rule?

4. Determine whether the set of data shown below displays exponential behavior. Write *yes* or *no*. Explain why or why not.

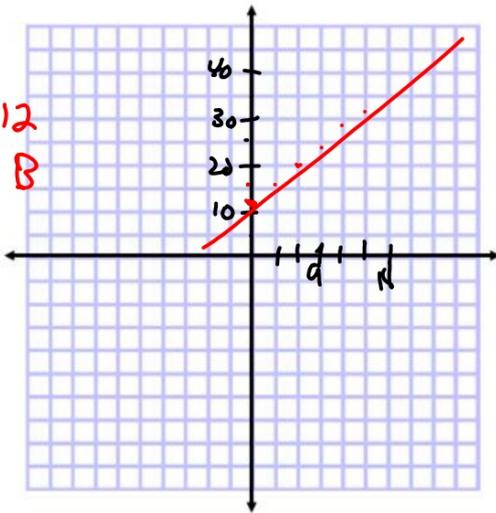
x	0	3	6	9	12	15
y	12	16	20	24	28	32

no

linear
(adding rule)

$$y = 4x + 12$$

m B



Is it a multiplying rule?

