

## 8-4 Graphing Exponentials

I can graph exponential functions given an equation

I can identify key features from an equation or a graph

Complete the input-output table for each of the parent exponential functions below.

$$2^3 = \frac{1}{2^3} = \frac{1}{8}$$

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

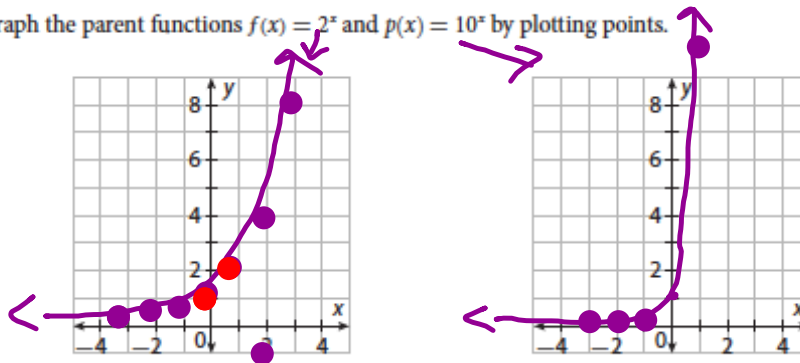
$$2^1 = \frac{1}{2^1}$$

$x$	$f(x) = 2^x$
-3	$\frac{1}{8}$
-2	$\frac{1}{4}$
-1	$\frac{1}{2}$
0	1
1	2
2	4
3	8

$x$	$p(x) = 10^x$
-3	$\frac{1}{1000}$
-2	$\frac{1}{100}$
-1	$\frac{1}{10}$
0	1
1	10
2	100
3	1000

$$\frac{1}{10^3} = \frac{1}{1000}$$

Graph the parent functions  $f(x) = 2^x$  and  $p(x) = 10^x$  by plotting points.



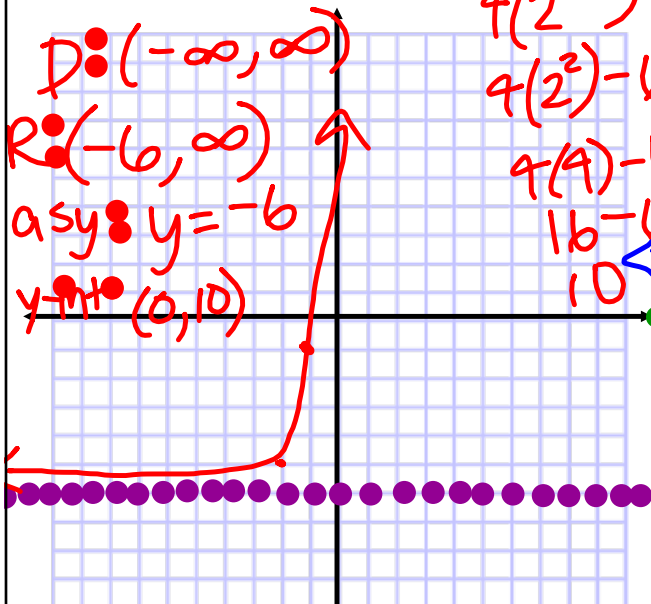
--Task--

Graph each function and state the domain, range, y-intercept, and asymptote for each.

$$g(x) = 4(2^{x+2}) - 6$$

$$f(x) = 2^x$$

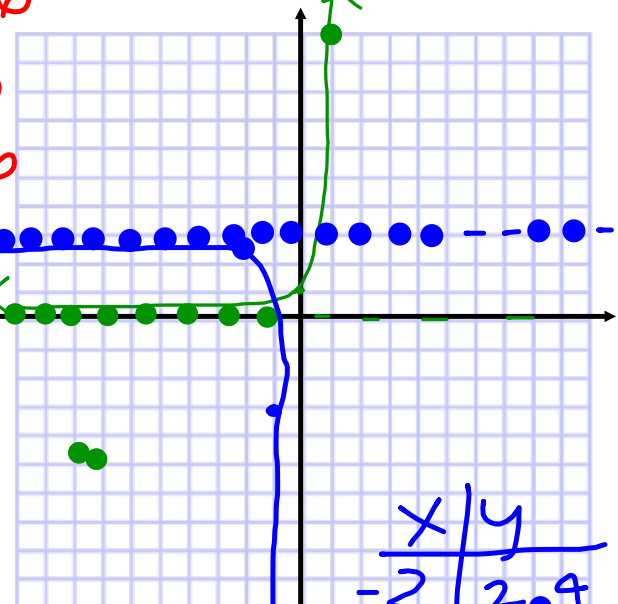
$$q(x) = -\frac{3}{5}(10^{x+2}) + 3$$



$D: (-\infty, \infty)$   
 $R: (-6, \infty)$   
 asy:  $y = -6$   
 y-int:  $(0, 10)$

V stretch by 4  
 left +2  
 down 6

$4(2^{x+2}) - 6$   
 $4(2^2) - 6$   
 $4(4) - 6$   
 $16 - 6$   
 $10$

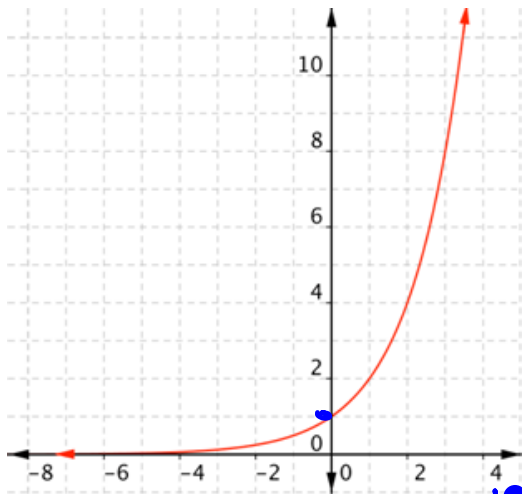


V reflection  
 V comp of 3/5  
 left +2  
 up 3

x	y
-2	2.9
1	-3
0	-57
2	



State the domain, range, y-intercept, asymptote, increasing, decreasing, and end behavior.



$$y = (2)^x$$

Domain:  $(-\infty, \infty)$

Range:  $(0, \infty)$

Y-intercept:  $(0, 1)$

Horizontal Asymptote:  $y = 0$

Increasing:  $(-\infty, \infty)$

Decreasing:  $\nearrow \downarrow$

End Behavior:

$$\lim_{x \rightarrow -\infty} f(x) = 0$$

$$\lim_{x \rightarrow \infty} f(x) = \infty$$

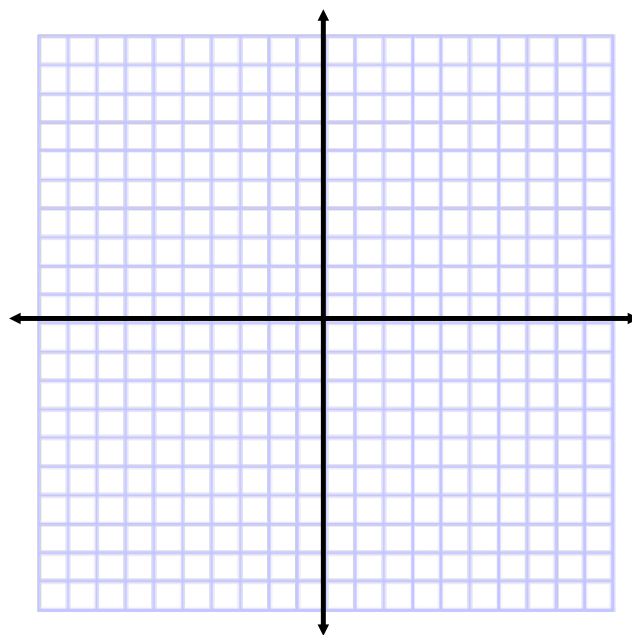
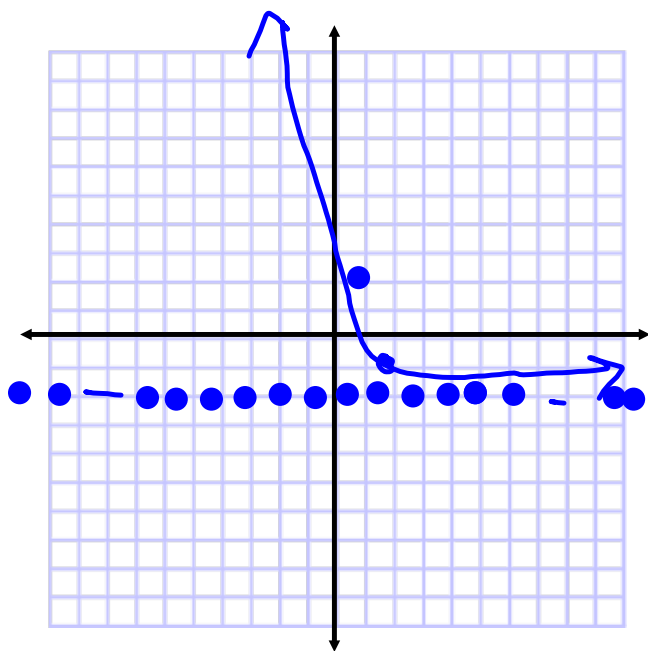
Graph each function and state the domain, range, y-intercept, and asymptote for each.

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

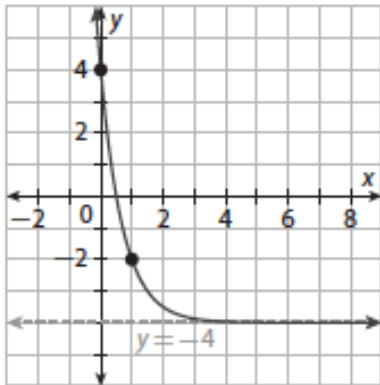
$g(x) = 3\left(\frac{1}{2}\right)^{x-2} - 2$

• stretch of 3  
• right 2  
• down 2

$g(x) = 3\left(\frac{1}{3}\right)^{x+2} - 4$



State the domain, range, y-intercept, asymptote, increasing, decreasing, and end behavior.



Domain:

Range:

Y-intercept:

Horizontal Asymptote:

Increasing:

Decreasing:

End Behavior:

