8-4 Graphing Exponentials

I can graph exponential functions given an equation

I can identify key features from an equation or a graph

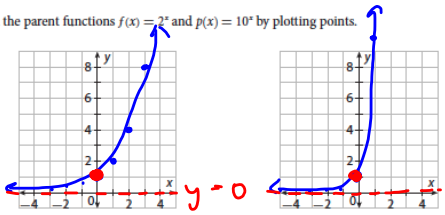
Complete the input-output table for each of the parent exponential functions below.

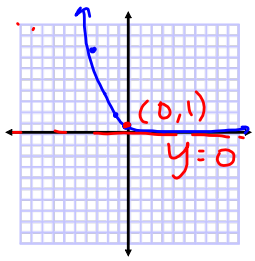
x	$f(x) = 2^x$
−3	1/8
−2	$2^{-2} = \frac{1}{2^2} = 1/4$
−1	1/2
0	$2^0 = 1$
1	$2^1 = 2$
2	$2^2 = 4$
3	$2^3 = 8$

x	$p(x) = 10^x$
−3	1/1000
−2	1/100
−1	1/10
0	1
1	10
2	100
3	1000

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

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





--Task--

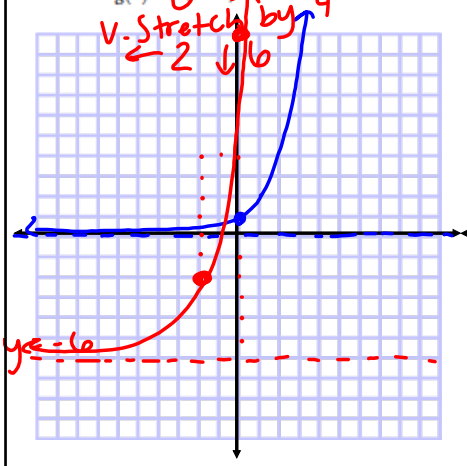
Graph each function and state the domain, range, y-intercept, and asymptote for each.

Parent: 2^x

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

V. Stretch by 4

← 2 ↓ 6



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

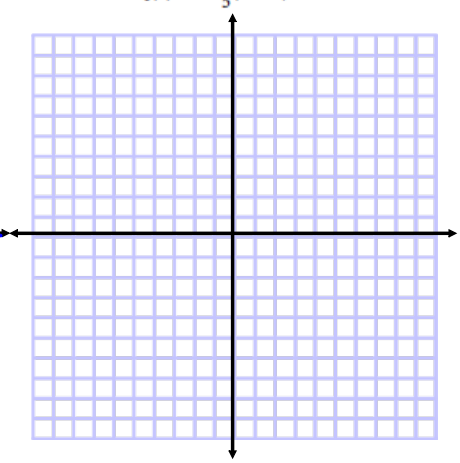
Range: $(-6, \infty)$

y-intercept: $(0, 10)$

$4(2)^{0+2} - 6 =$

H. Asymptote: $y = -6$

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



Domain:

Range:

y-intercept:

H. Asymptote:

How to find:

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

x-values

Range: $(0, \infty)$ before transformations

y-values

- changes from V. Shifts

H.A.

V. Flip

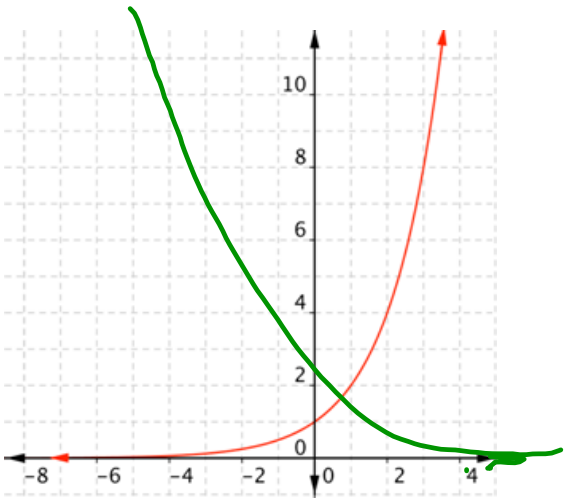
y-intercept: $(0, y)$

Plug in $x=0$

H. Asymptote: $y = 0$

Matches V. Shift

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



Domain:

Range:

Y-intercept:

Horizontal Asymptote:

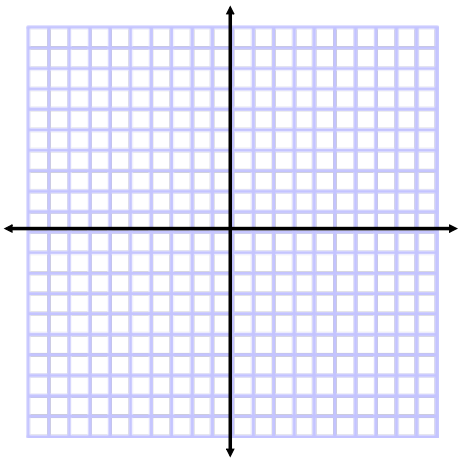
Increasing:

Decreasing:

End Behavior:

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

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



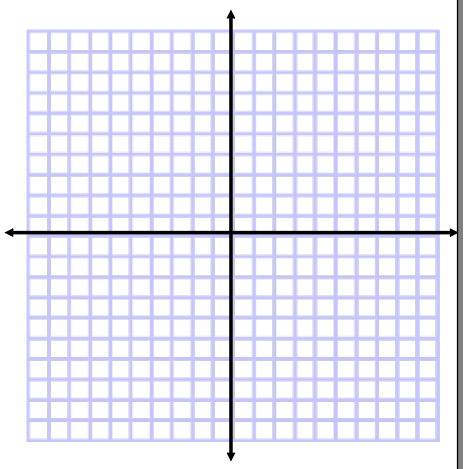
Domain:

Range:

y-intercept:

H. Asymptote:

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



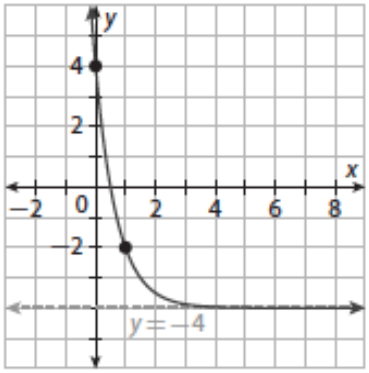
Domain:

Range:

y-intercept:

H. Asymptote:

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



Domain:

Range:

Y-intercept:

Horizontal Asymptote:

Increasing:

Decreasing:

End Behavior: