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	$2^{-2} = 1/4$
−1	$2^{-1} = 1/2$
0	$2^0 = 1$
1	$2^1 = 2$
2	$2^2 = 4$
3	$2^3 = 8$

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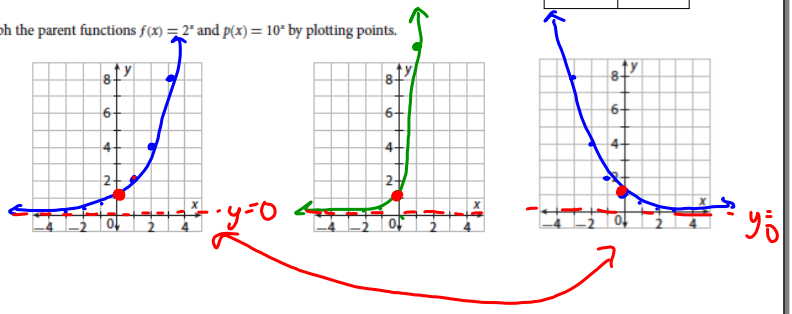
x	$p(x) = 10^x$
−3	1/1000
−2	1/100
−1	1/10
0	1
1	10
2	100
3	1000

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.

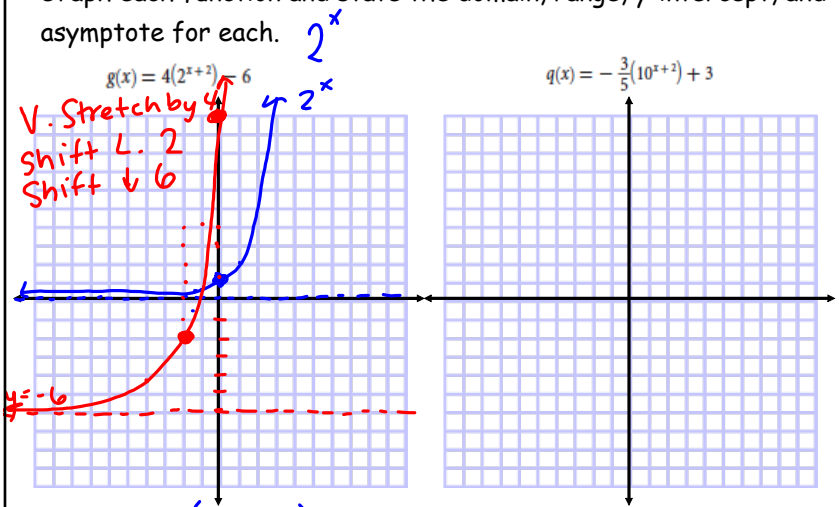


--Task--

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

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

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



y-int: (0, 10)

Plug in $x = 0$

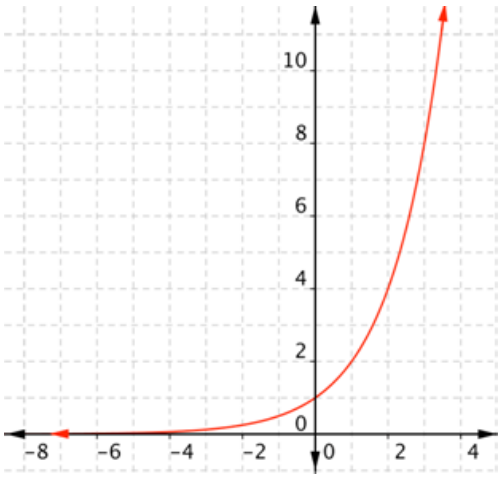
$4(2^{0+2}) - 6$

$4(2^2) - 6$

$4(4) - 6$

$16 - 6 = 10$

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



Domain:

Range:

Y-intercept:

Horizontal Asymptote:

Increasing:

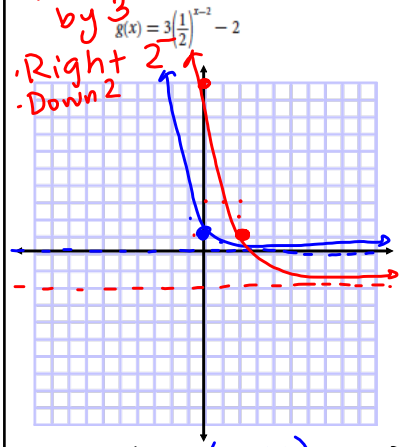
Decreasing:

End Behavior:

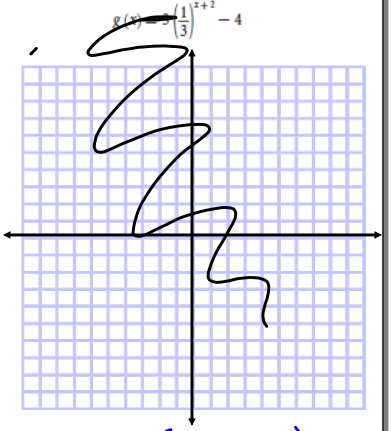
Graph each function and state the domain, range, y-intercept, and asymptote for each.

- V. Stretch by 3
- Right 2
- Down 2

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



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



y-int: $(0, 10)$

$3\left(\frac{1}{2}\right)^{0-2} - 2$

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

$3(2^2) - 2$

$3(4) - 2$

$12 - 2 = 10$

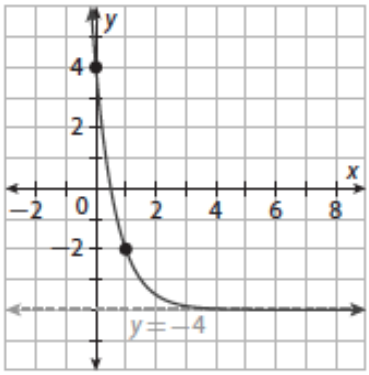
Domain: $(-\infty, \infty)$

Range: $(-2, \infty)$

y-int:

H. Asymptote: $y = -2$

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



Domain:

Range:

Y-intercept:

Horizontal Asymptote:

Increasing:

Decreasing:

End Behavior:

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

= x-values

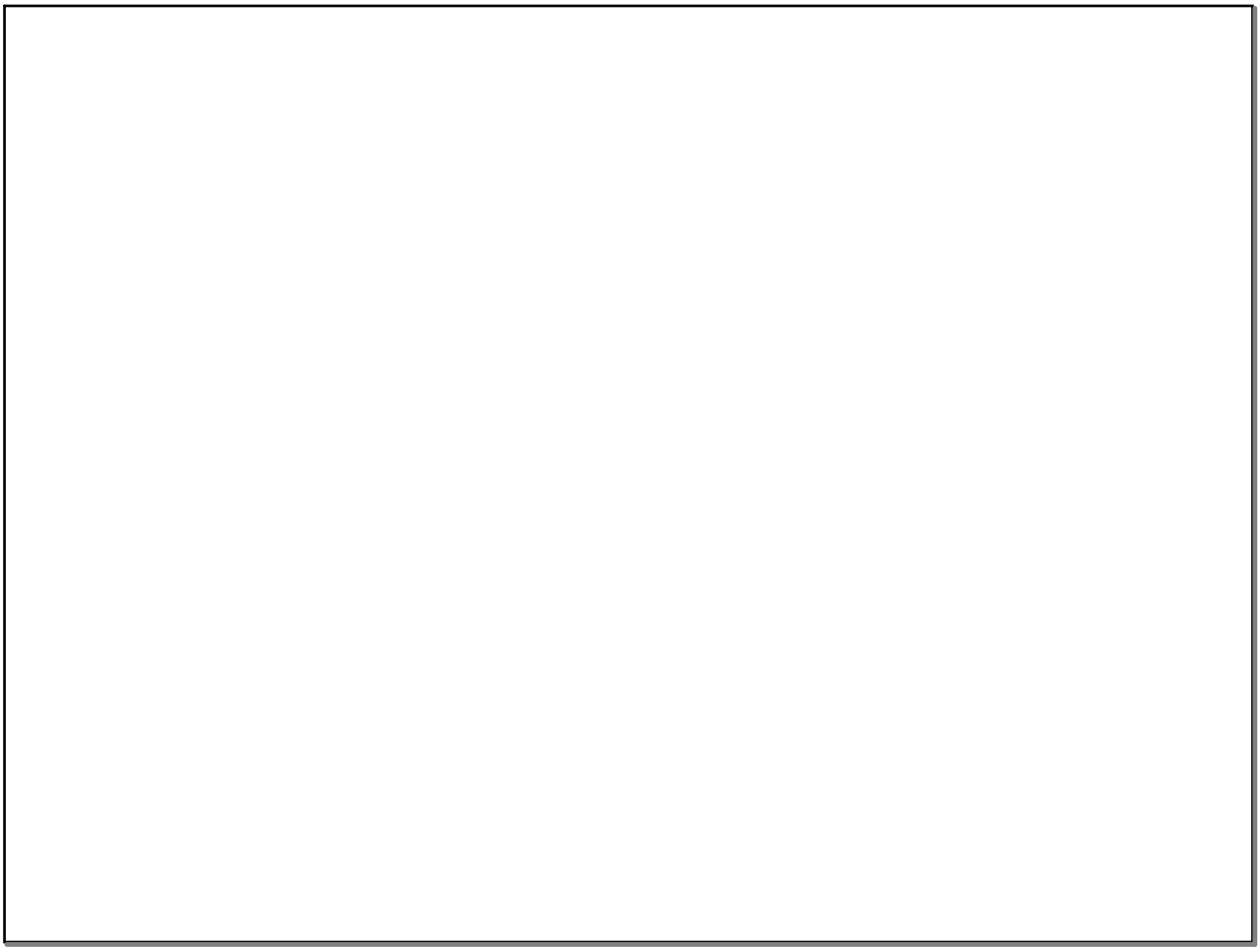
Range: $(0, \infty)$

y-values

- H. asymptote (v. Shift)
- V. Flip

y-int: $(0, y)$

plug in 0 for x

H. Asymptote: $y = 0$ Match

Shift Up/Down