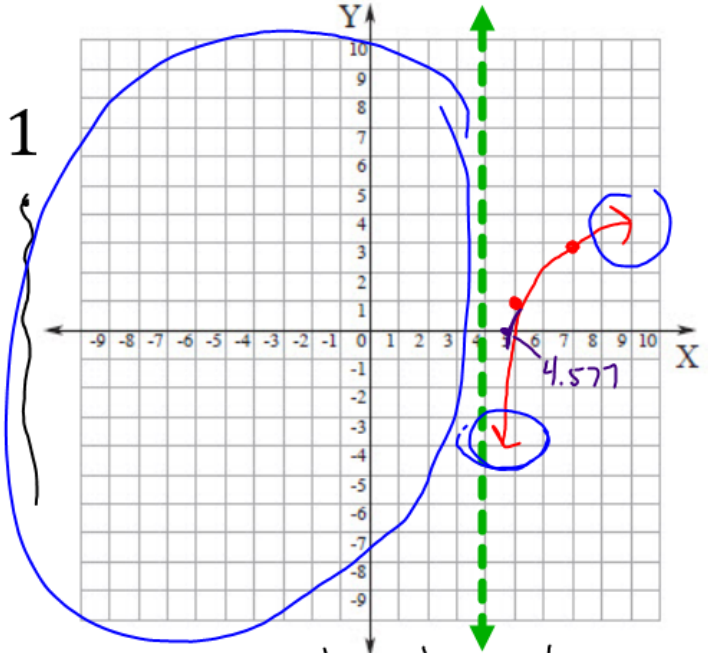
Warm Up

Right 4 Up 1 Stretch by 2

$$y = 2\log_3(x-4)+1$$

Start	Right 4	Stretch by 2	Up 1
(1,0)	(5,0)	(5,0)	(5,1)
(3,1)	(7,1)	(7,2)	(7,3)
x=0 asy.	x=4	x=4	x=4



Domain: $(4, \infty)$

Range: $(-\infty, \infty)$ *Always*

Asymptote: $x = 4$

y-intercept: N/A

end behavior:

as $x \to \infty$ $y \to \infty$

as $x \to 4$ $y \to -\infty$

x-intercept

$$0 = 2\log_3(x-4)+1$$
$$-1 \quad\quad -1$$

$$\frac{-1}{2} = \frac{2\log_3(x-4)}{2}$$

$$-\tfrac{1}{2} = \log_3(x-4)$$

$$3^{-\frac{1}{2}} = x-4$$

$x = 4.577$

$$.577 = x-4$$
$$+4 \quad\quad +4$$

Characteristics of Logarithmic Graphs

Domain (x)

Left to Right

(Left, Right)

Range (y)

(Down, Up)

(Low, High)

Asymptote

Vertical Line

$x = \#$

X-Intercepts

Touches x-axis

Plug in 0 for y.

Set equation = 0 & solve for x.

Y-Intercepts

Touches y-axis.

Plug 0 in for x

End Behavior

as $x \to \infty$ $y \to$ ____

as $x \to$ asymptote $y \to$ ____

Graph and Identify the characteristics of the graph:

$$y = 4log_2(x+3) - 1$$

Domain $(-3, \infty)$

Range $(-\infty, \infty)$

X-Intercept -1.811

* Y-Intercept 5.339

End Behavior as $x \to -3$, $y \to -\infty$; as $x \to -3$, $y \to -\infty$

Asymptote $x = -3$

$0 = 4\log_2(x+3) - 1$

$1 = 4\log_2(x+3)$

$\frac{1}{4} = \log_2(x+3)$

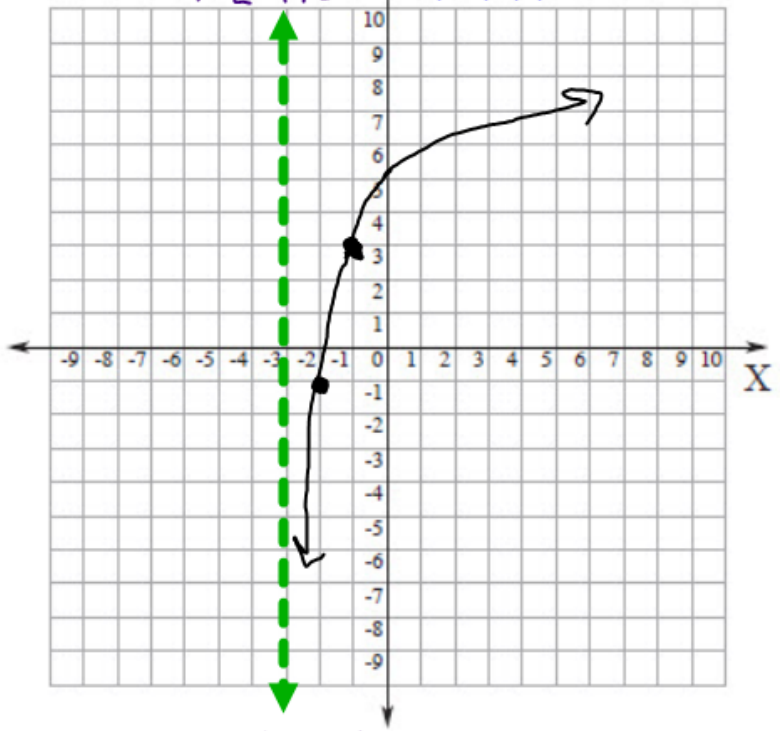
$2^{1/4} = x+3$

$1.189 = x+3$

$-3 \quad -3$

$x = -1.811$

$x=0$ $(1,0)$ $(2,1)$ | $x=-3$ $(-2,0)$ $(-1,1)$ Left 3 | $x=-3$ $(-2,0)$ $(-1,4)$ stretch 4 | $x=-3$ $(-2,1)$ $(-1,3)$ Down 1



$y = 4\log_2(0+3) - 1$

$y = 4 \cdot [\log_2(3)] - 1$

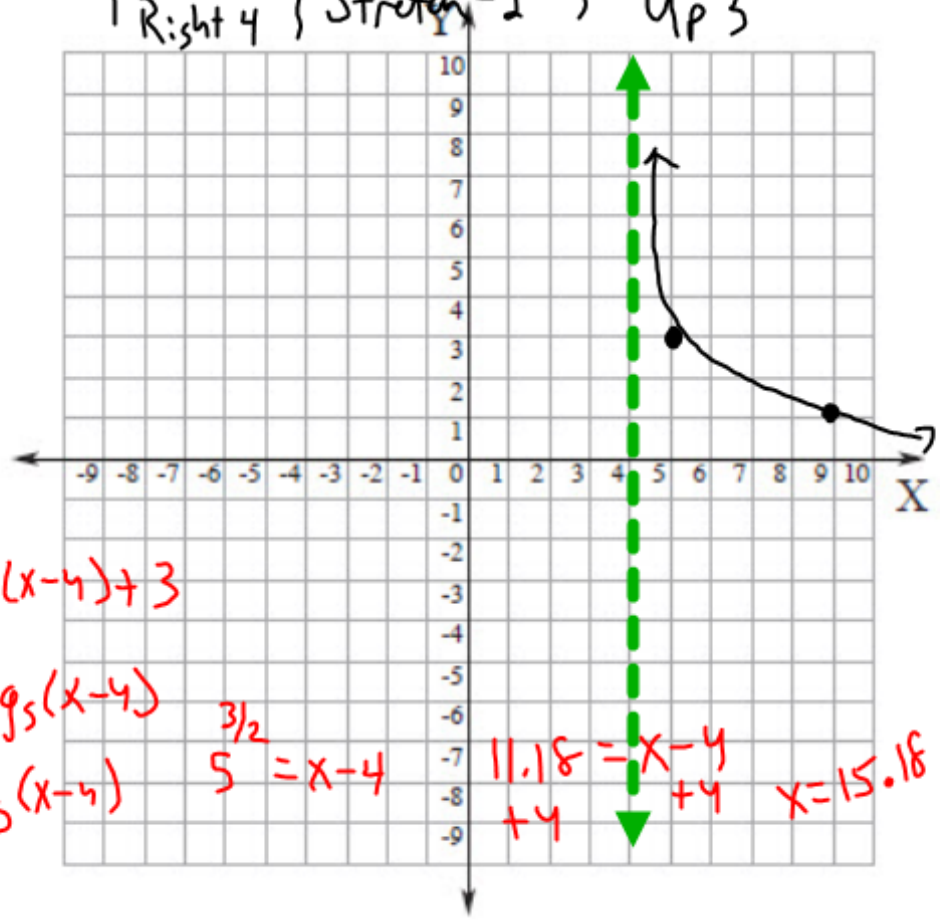
$y = 4\left(\frac{\log 3}{\log 2}\right) - 1$

$y = 5.339$

Graph and Identify the characteristics of the graph:

$$y = -2log_5(x-4)+3$$

(1,0) (5,0) (5,0) (5,3)
(5,1) (9,1) (9,-2) (9,1)
x=0 x=4 x=4 x=4
Right 4 Stretch -2 Up 3



Domain $(4, \infty)$

Range $(-\infty, \infty)$

X-Intercept 15.18

Y-Intercept N/A

End Behavior as $x \to \infty$ $y \to -\infty$
as $x \to 4$ $y \to \infty$

Asymptote
$x = 4$

x-int: $0 = -2\log_5(x-4)+3$

$-3 = -2\log_5(x-4)$

$\frac{3}{2} = \log_5(x-4)$

$5^{3/2} = x-4$

$11.18 = x-4$

$+4 \quad +4$

$x = 15.18$

Unit 5 Test 2 Review