To graph an exponential function like $f(x) = -2 \cdot 3^{\frac{x+1}{4}}$ **:**

Step 1: **Find the value of** x **that makes the exponent equal to 0**

$$\frac{x+1}{4} = 0$$
$$x+1 = 0$$
$$x = -1$$

Step 2: **Use the value of** x **you found as the middle of a set of** x **values that you plug into** $f(x)$

x	$f(x)$
-3	$-2 \cdot 3^{\frac{-3+1}{4}} = -2 \cdot 3^{\frac{-2}{4}} = -2 \cdot 3^{-\frac{1}{2}} \approx -1.2$
-2	$-2 \cdot 3^{\frac{-2+1}{4}} = -2 \cdot 3^{\frac{-1}{4}} = -2 \cdot 3^{-\frac{1}{4}} \approx -1.5$
-1	$-2 \cdot 3^{\frac{-1+1}{4}} = -2 \cdot 3^{\frac{0}{4}} = -2 \cdot 3^{0} = -2$
0	$-2 \cdot 3^{\frac{0+1}{4}} = -2 \cdot 3^{\frac{1}{4}} \approx -2.6$
1	$-2 \cdot 3^{\frac{1+1}{4}} = -2 \cdot 3^{\frac{2}{4}} = -2 \cdot 3^{\frac{1}{2}} \approx -3.5$

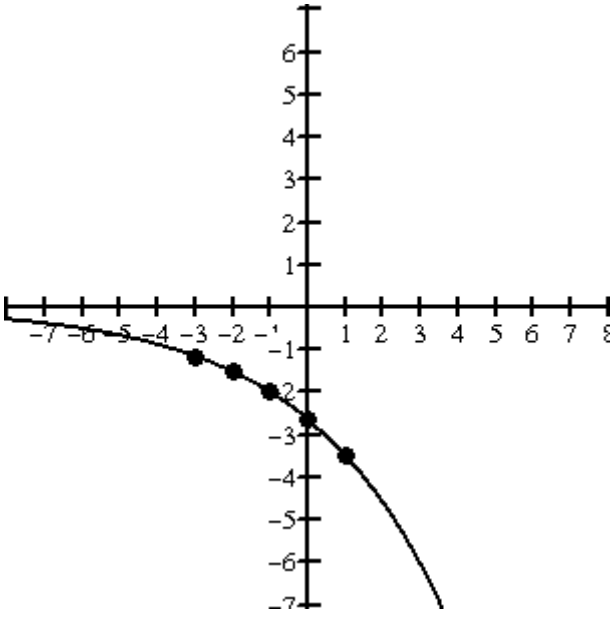
When doing the last step of each calculation above in your calculator,
use the $\boxed{\wedge}$ **button or the** $\boxed{y^x}$ **button,**
put parentheses around the exponent,
and pay attention to your order of operations (exponents before multiplication).

If the base is e**, use the** $\boxed{e^x}$ **button.**

Step 3: **Plot the points you just found**

$$(-3, -1.2),\ (-2, -1.5),\ (-1, -2),\ (0, -2.6),\ (1, -3.5)$$

Step 4: **Connect them together into the familiar shape of an exponential curve:**
going quickly up to infinity (or down to negative infinity) on one side,
and going more and more slowly to the horizontal asymptote of $y = 0$ **on the other side**



To graph a logarithm function like $f(x) = 2\log_3 5(x-2)$**:**

Step 1: **Find the domain by solving for the argument inside the logarithm greater than 0**

$5(x-2) > 0$
$x - 2 > 0$
$x > 2$ ⬅ **the vertical asymptote will be at** $x = 2$

Step 2: **Use the domain you found to create a set of** x **values that you plug into** $f(x)$
Also put in fractional values of x **between the vertical asymptote and the first integer value of** x

x	$f(x)$
2.1	$2\log_3 5(2.1-2) = 2\log_3 5(0.1) = 2\log_3 0.5 \approx -1.3$
2.5	$2\log_3 5(2.5-2) = 2\log_3 5(0.5) = 2\log_3 2.5 \approx 1.7$
3	$2\log_3 5(3-2) = 2\log_3 5(1) = 2\log_3 5 \approx 2.9$
4	$2\log_3 5(4-2) = 2\log_3 5(2) = 2\log_3 10 \approx 4.2$
5	$2\log_3 5(5-2) = 2\log_3 5(3) = 2\log_3 15 \approx 4.9$

When doing the last step of each calculation above in your calculator,
use the other handout (from my website) about the change of base formula.

Step 3: **Plot the points you just found**

$(2.1, -1.3)$, $(2.5, 1.7)$, $(3, 2.9)$, $(4, 4.2)$, $(5, 4.9)$

Step 4: **Connect them together into the shape of a logarithmic curve:**
going more and more slowly up to infinity (or down to negative infinity) on the side,
and going quickly in the opposite direction to the vertical asymptote you found in step 1.