exponential functions

$$f(x) = a^x$$

$a > 0 \quad a \neq 1$

$f(x) = 2^x \qquad x = -3.1$

$f(-3.1) = .1166291$

$$2^{-3.1} \rightarrow \frac{1}{2^{3.1}}$$

$f(x) = 2^{-x}$ $\quad x = \pi$

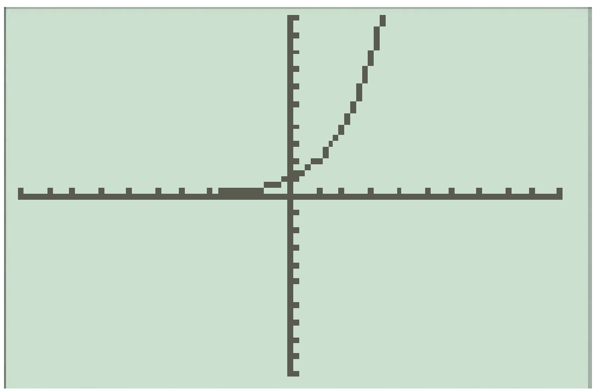
$f(\pi) = 2^{-\pi} =$

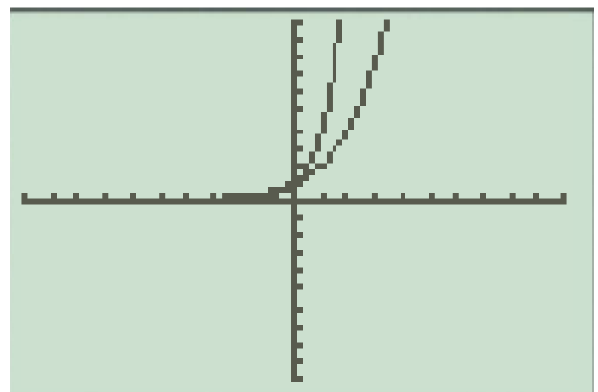
$f(x) = 0.6^{3/2} = .4647580$

$y = a^x$

$y = 2^x$

$y = 4^x$



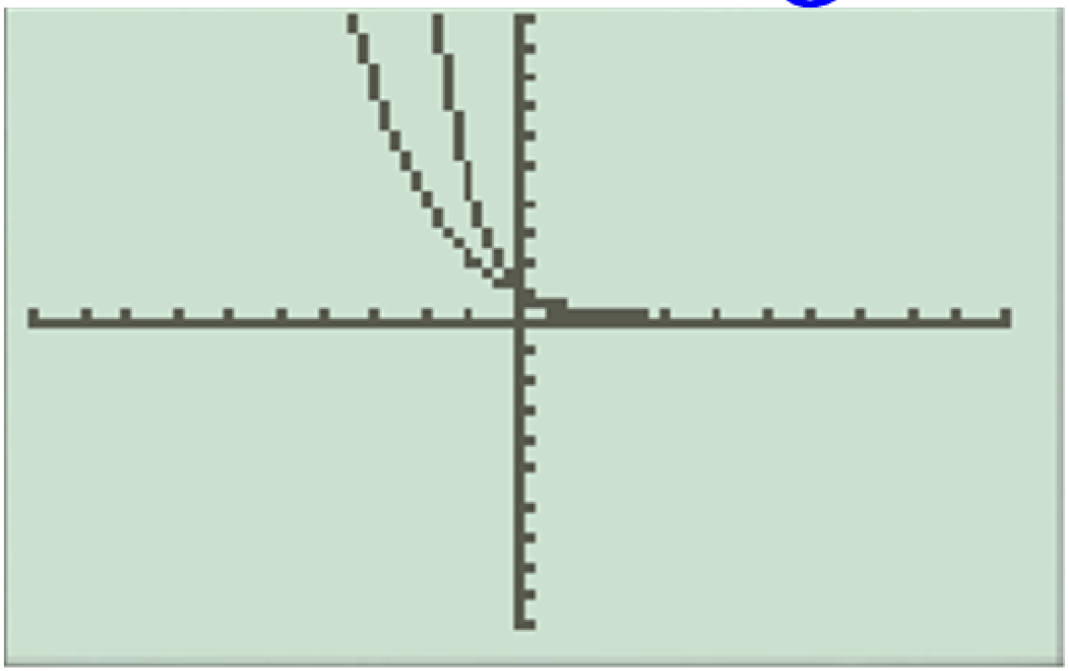


The higher the "a" is the steeper the graph becomes.

$y = a^{-x}$

$y = 2^{-x}$

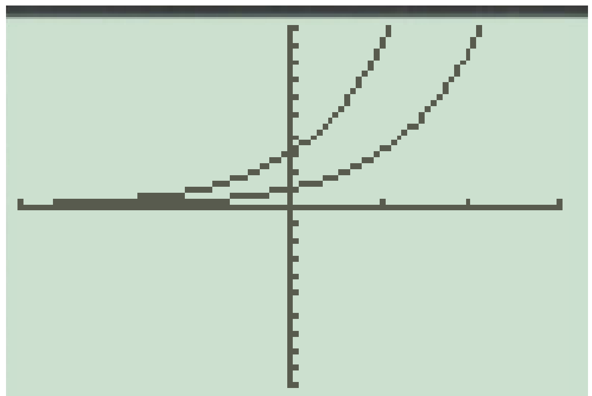
$y = 4^{-x}$



When the exponent is negative the graph changes direction instead of rising as x gets larger the graph falls.

$y = 3^x \rightarrow y = 3^{x+1}$

x	y
0	1
1	3
2	9
3	27



x	y
0	3
1	9
2	27
3	81

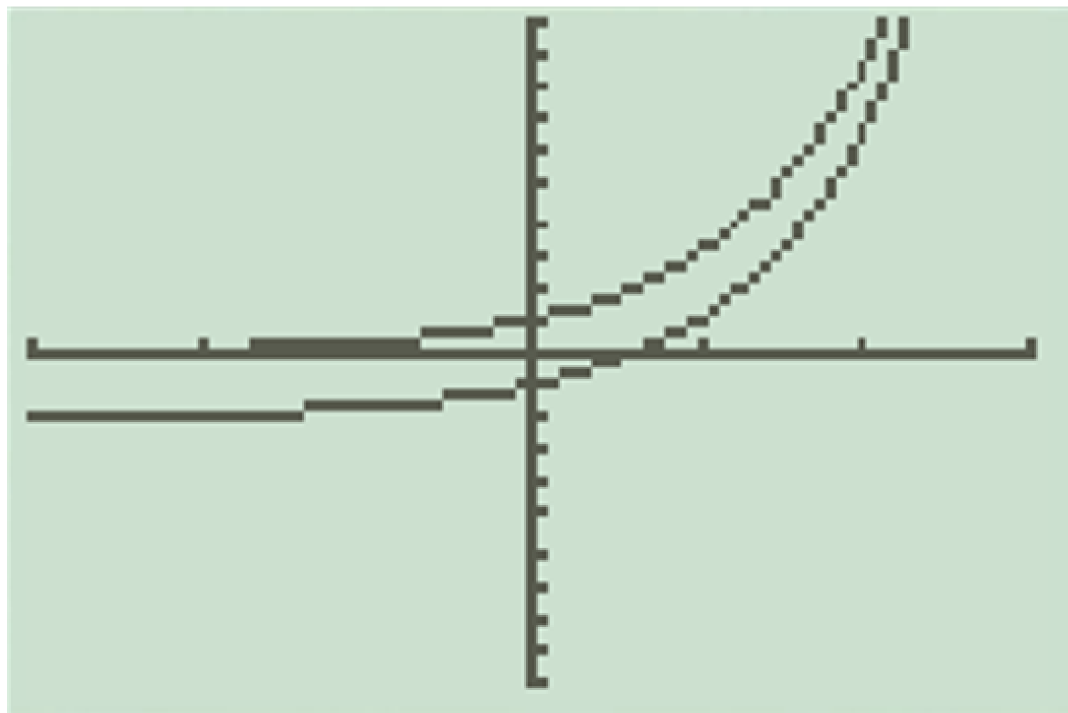
When a number is added to the exponent the graph shifts the same amount to the left. If a number is subtracted from the exponent the graph will shift that amount to the right

$y = 3^x$

x	y
2	9
100	5.15×10^{47}

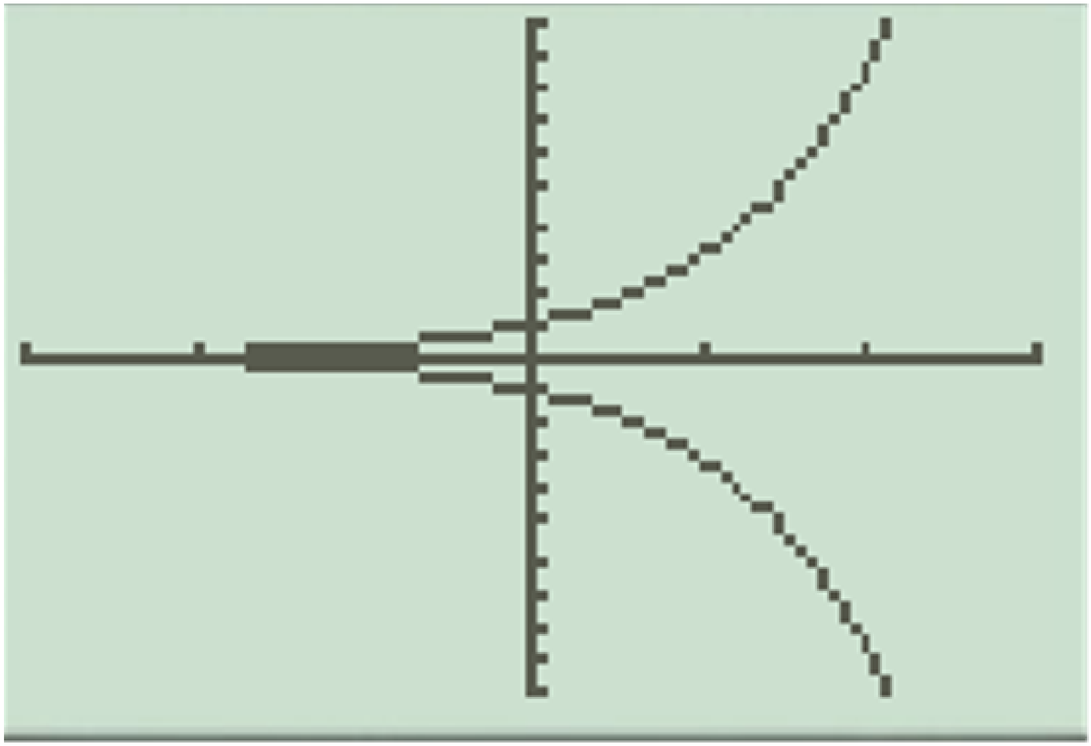
$y = 3^x - 2$

x	y
2	7
100	



If a number is added or subtracted from the function the graph is shifted up or down by the same amount

$f(x) = 3^x$ $f(x) = -3^x$



If the function is multiplied by a negative then the graph mirrors over the x access.

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