Zero and Negative Exponents

1) Use your calculator to find each of the following values:

$a.\quad 2^0 =$ $\qquad b.\quad 3^0 =$ $\qquad c.\quad 5^0 =$ $\qquad d.\quad 23^0 =$

2) What seems to be the value for *any base to the zero power?*

3) Make a table of values for the following function? $f(x) = 5(2)^x$

x	0	1	2	3	4	5	6
f(x)							

4) Why does it make sense in the equation that 2^0 is 1?

$f(x) = 5(2)^x$ $f(x) = 4(3)^x$ $f(x) = 3(5)^x$ $f(x) = 7(2.5)^x$

1) Of the functions given above, which grows the fastest? Explain.

2) Of the functions given above, which graph would cross the y-axis at the highest value? Explain.

3) What differences would you see in the table of values for the two functions given below?

$$f(x) = 3(6)^x \qquad f(x) = 6(3)^x$$

Suppose you are on a team studying the growth of bacteria in a laboratory experiment. At the start of your work shift(8 am) in the lab, ***there are 64 bacteria*** in one petri dish culture, and the population seems to be ***doubling every hour***.

1) Write a rule that should predict the number of bacteria in the culture at a time *x* hours after the start of your work shift?

2) Complete the table below

x	-3	-2	-1	0	1	2	3
f(x)							

3) What do the negative values in the table mean in the context of the problem?

Suppose you are on a team studying the growth of bacteria in a laboratory experiment. At the start of your work shift(8 am) in the lab, ***there are 90 bacteria*** in one petri dish culture, and the population seems to be ***tripling every hour***.

1) Write a **function rule** and a **recursive rule** that should predict the number of bacteria in the culture at a time *x* hours after the start of your work shift?

2) Complete the table below

x	-3	-2	-1	0	1	2	3
f(x)							

3) What do the negative values in the table mean in the context of the problem?