Discovering Exponents Key

Write the answers to each of the exercises in the space provided. Your answer must be in the form of either a whole number or a fraction (NO DECIMALS). You are NOT allowed to use a calculator. Simply follow the pattern.

a) $2^5 = $ _32_

b) $3^4 = $ _81__

c) $4^3 = $ _64__

   $2^4 = $ _16_

   $3^3 = $ _27__

   $4^2 = $ _16__

   $2^3 = $ _8__

   $3^2 = $ _9__

   $4^1 = $ _4__

   $2^2 = $ _4__

   $3^1 = $ _3__

   $4^0 = $ _1__

   $2^1 = $ _2__

   $3^0 = $ __1_

   $4^{-1} = $ _1/4_

   $2^0 = $ _1__

   $3^{-1} = $ _1/3__

   $4^{-2} = $ _1/16__

   $2^{-1} = $ _1/2__

   $3^{-2} = $ _1/9__

   $4^{-3} = $ _1/64_

   $2^{-2} = $ _1/4_

   $3^{-3} = $ _1/27_

   $4^{-4} = $ _1/256_

   $2^{-3} = $ _1/8_

   $3^{-4} = $ _1/81_

   $4^{-5} = $ _1/1024_

   $2^{-4} = $ _1/16_

   $3^{-5} = $ __1/243___

   $2^{-5} = $ _1/32_

Conclusions:

1. Based on your results above, what conclusions can you draw about

a) the exponent 1?

anything to the exponent 1 is equal to itself

b) the exponent 0?

anything to the exponent 0 is equal to 1

c) negative exponents?

anything to a negative exponent is equal to its reciprocal with a positive exponent

2. Write general rules for your conclusions, using *x* as your base and *m* as your exponent for the rule for negative exponents. The rules have been started for you below.

a) $x^1 = x$

b) $x^0 = 1$

c) $x^{-m} = 1/x^m$

Grading yourself:
Limited - you were able to get all the values on the first page correct. You were able to reach the correct conclusions in #1 a & b and write the correct rules for #2 a & b.
Adequate - you were able to get all the values on the first page correct. You were able to reach the correct conclusions in #1 a & b and write the correct rules for #2 a & b. You were able to draw the correct conclusions and the rule for #1c and #2c after looking at both hints.

Substantial - you were able to get all the values on the first page correct. You were able to draw the correct conclusions in #1 a & b and write the correct rules for #2 a & b. You were able to draw the correct conclusions and the rule for #1c and #2c after looking at one hint.
Excellent - you were able to get all the values on the first page correct. You were able to reach all the correct conclusions in #1 and write the correct rules for #2 without looking at any hints.