Discovering Exponents

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) $2^5 = \underline{\,32\,}$

     $2^4 = \underline{\,16\,}$

     $2^3 = \underline{\qquad}$

     $2^2 = \underline{\qquad}$

     $2^1 = \underline{\qquad}$

     $2^0 = \underline{\qquad}$

     $2^{-1} = \underline{\qquad}$

     $2^{-2} = \underline{\qquad}$

     $2^{-3} = \underline{\qquad}$

     $2^{-4} = \underline{\qquad}$

     $2^{-5} = \underline{\qquad}$

b) $3^4 = \underline{\qquad}$

     $3^3 = \underline{\qquad}$

     $3^2 = \underline{\qquad}$

     $3^1 = \underline{\qquad}$

     $3^0 = \underline{\qquad}$

     $3^{-1} = \underline{\qquad}$

     $3^{-2} = \underline{\qquad}$

     $3^{-3} = \underline{\qquad}$

     $3^{-4} = \underline{\qquad}$

     $3^{-5} = \underline{\qquad}$

c) $4^3 = \underline{\qquad}$

     $4^2 = \underline{\qquad}$

     $4^1 = \underline{\qquad}$

     $4^0 = \underline{\qquad}$

     $4^{-1} = \underline{\qquad}$

     $4^{-2} = \underline{\qquad}$

     $4^{-3} = \underline{\qquad}$

     $4^{-4} = \underline{\qquad}$

     $4^{-5} = \underline{\qquad}$

Conclusions:

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

a) the exponent 1?

b) the exponent 0?

c) negative exponents?

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) $x^1 =$

b) $x^0 =$

c) $x^{-m} =$