



Discovering Exponent Rules

Run the **EXPRULES** program by pressing **[PRGM]** then choosing it from the menu and pressing **[ENTER]**.

This program allows you to explore 6 different rules of exponents by helping you evaluate exponential expressions for different values of x and y . To begin, choose **Experiment**, then type **1** to explore Rule 1.

The program displays the expression that you will be calculating to explore Rule 1, $2^x 2^y$. Calculate the expression several times, choosing values from 1 through 8 for x and y . Make and test a conjecture.

Repeat this process to explore rules 2 – 6. Pay attention to the prompts, as some rules require you to enter negative values for the variables. Record your conjectures below.

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EXPRULES
1: Experiment
2: ViewLastRound
3: Exit
  
```

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Rule 1      2^x*2^y=?
  
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- Rule 1: Make a rule for the product of two powers with like bases.
- Rule 2: Make a rule for the quotient of two powers with like bases.
- Rule 3: Make a rule for the power of a power.
- Rule 4: Make a rule for a power with a negative exponent.
- Rule 5: Make a rule for a power with a zero exponent.
- Rule 6: Make a rule for the power of a quotient.

Extension

Use your calculator to evaluate each of the expressions shown.

Then make a conjecture for $m^{\frac{1}{n}}$.

$36^{\frac{1}{2}} = \underline{\hspace{2cm}}$
 $8^{\frac{1}{3}} = \underline{\hspace{2cm}}$
 $49^{\frac{1}{2}} = \underline{\hspace{2cm}}$
 $16^{\frac{1}{2}} = \underline{\hspace{2cm}}$
 $16^{\frac{1}{4}} = \underline{\hspace{2cm}}$

Complete: $m^{\frac{1}{n}} = \underline{\hspace{4cm}}$