

Content and Language Objective:

Students will begin to explore the various rules involving exponents and be able to explain in their own words how the exponent rules work.

Warm-Up

1. $\left(\frac{4}{5} \bullet \frac{5}{8}\right) \div \frac{1}{2}$ $\frac{1}{1} \times \frac{1}{2} = \frac{1}{2} \times \frac{2}{1} = \frac{2}{2} = 1$

2. $\frac{6}{1} \bullet \frac{2}{3} \bullet \frac{3}{1} \bullet \left(-\frac{1}{6}\right)$ $-\frac{36}{18} \div \frac{6}{6} = -\frac{6}{3} \div \frac{3}{3}$
 $\frac{6}{1} \times \frac{2}{3} \times \frac{3}{1} \times \frac{-1}{6} = -\frac{2}{1}$ $\Rightarrow \frac{2}{1}$ or 2

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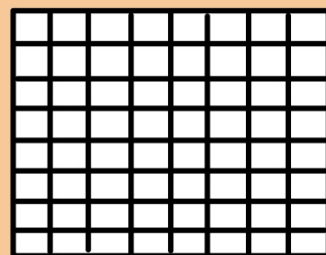
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BASES AND POSITIVE EXPONENTS

The area of a square that is 8 inches on a side is given by the expression.

$$8 \bullet 8 = 8^2 = 64 \text{ square inches}$$

The expression 8^2 is an exponential expression with base 8 and exponent 2.



8 inches

8 inches

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Exponential expressions occur frequently in a variety of applications. For example suppose that an investment doubles its initial value 3 times.

$$2 \bullet 2 \bullet 2 = 2^3 = 8$$

So the rule for using exponents is as follows:

$$a^n = a \bullet a \bullet a \bullet \cdots \bullet a$$

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EXPRESSION	BASE	EXPONENT
2^3	2	3
6^4	6	4
7^1	7	1
0.5^2	0.5	2
x^3	x	3

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Read 0.5^2 as "0.5 squared"

Read 2^3 as "2 cubed"

Read 6^4 as "6 to the fourth power"

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Using the given base, write each number as an exponential expression.

1.) 10,000 (base 10) = 10^4

2.) 27 (base 3) = 3^3

3.) 32 (base 2) = 2^5

