

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

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

Handwritten work in pink:

$$\frac{20}{40} \cdot \frac{2}{1} = \frac{40}{40} = 1$$

$$2. 6 \bullet \frac{2}{3} \bullet 3 \bullet \left(-\frac{1}{6} \right)$$

Handwritten work in pink:

$$= -\frac{36}{18} = -\frac{2}{1} = \textcircled{-2}$$

$$8. \frac{(-4^2+1)}{\frac{2}{3}}$$

$$\frac{-16+1}{\frac{2}{3}}$$

$$\frac{-15}{1} \div \frac{2}{3}$$

$$-\frac{15}{1} \cdot \frac{3}{2} = \frac{-45}{2}$$

$$\begin{array}{ll} -2^2 & (-2)^2 \\ -1 \cdot 2^2 & (-2)(-2) \\ -1 \cdot 4 & 4 \\ -4 & \end{array}$$

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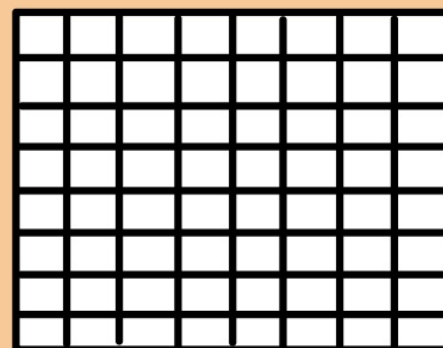
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BASES AND POSITIVE EXPONENTS

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

