



- Agenda**
- Algebra Nation WB**
- Spiral/composition notebook**
- Pen (for notes if preferred)**
- PENCIL**

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AN pg 13

Section 1 – Topic 5 Properties of Exponents

➤ This is the **zero exponent property**: $a^0 = \underline{\quad 1 \quad}$.

➤ This is the **negative exponent property**: $a^{-n} = \underline{\frac{1}{a^n}}$
and $\frac{1}{a^{-n}} = \underline{a^n}$.

$$2^4 = 2 \cdot 2 \cdot 2 \cdot 2 = 16$$

$$2^3 = 2 \cdot 2 \cdot 2 = 8$$

$$2^2 = 2 \cdot 2 = 4$$

$$2^1 = 2$$

$$2^0 = 2^1 \div 2 = 2 \div 2 = 1$$

$$2^{-1} = 2^0 \div 2 = 1 \div 2 = \frac{1}{2} = \frac{1}{2^1}$$

$$2^{-2} = 2^{-1} \div 2 = \frac{1}{2} \div 2 = \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{2^2}$$

We are dividing by 2 each time.

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➤ This is the **product property**: $a^m \cdot a^n = a^{m+n}$.

➤ This is the **quotient property**: $\frac{a^m}{a^n} = a^{m-n}$.

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➤ This is the **power of a power property**: $(a^m)^n = a^{mn}$.

➤ This is the **power of a product property**: $(ab)^n = a^n b^n$.

➤ This is the **power of a quotient property**: $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$.

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Expressions
Properties of Exponents
Independent Practice

1. Simplify the following expressions:

Part A: $\frac{2x^3y^3}{4y^2} =$

Part B: $\left(\frac{x^{-8}}{y^{11}}\right)^{-2} =$

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Part C: $\frac{(2x^3)(x^4)^2}{8x^{11}} =$

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2. Your neighbor has a square-shaped pool with side lengths of $3a^5$. What is the area of the pool?

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3. Consider each equation. Find the value of m in each equation below. Justify your answer. Try with your neighbor. Justify can be simply showing mathematically how your answer proves the equation.

$$(x^m \cdot x^2)^3 (k^3)^5 = x^{21} k^{15}$$



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$$m = -4$$



$$x^3 \cdot y^2 \left(\frac{x^2 \cdot y^3 \cdot z^m}{z^{-5}} \right) = x^5 y^5 z$$

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$$\left(\frac{x^8}{yz^5}\right)^m = 1$$

$$m = 0$$



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4. John buys a water tank from a company that likes to use exponents as dimensions. The tank he buys has the dimensions b^2 by b^4 by $4c^3$. Which of the following expressions represent the volume of the water tank?

- A $4b^8c^3$
- B $4b^6c^3$
- C $12b^8c^3$
- D $2b^6c^3$

B

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5. Consider the equation $a^{-3} = \left(\frac{1}{a}\right)^5$.

a = 1, -1

What value(s) of a make the equation true?



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6. Harry, Louis and Niall are working with exponents. Harry claims $4^2 \cdot 4^5 = 4^{10}$. Louis claims $4^2 \cdot 4^5 = 4^7$. Niall claims $4^2 \cdot 4^5 = 16^7$. Which student has the correct answer? Explain why.

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Homework - Due Wed due to Field Trip tomorrow

Pearson Page 204

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Show work on separate sheet of paper

If you will be on the Field Trip tomorrow, be sure to look over the notes that will be posted on my website. I will be going over Distributive Property with those who are present.

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