

Bellwork

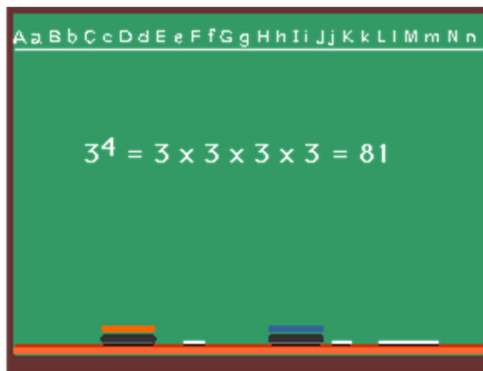
1. $X^5 =$

2. $2x - 5 = 11$

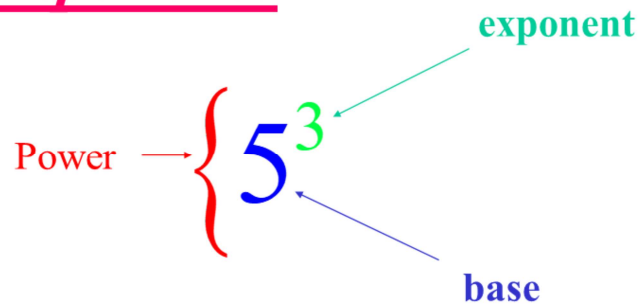
3. $3^2 + 5 =$

The Laws of Exponents

So far this seems pretty easy.



Exponents



Example: $125 = 5^3$ means that 5^3 is the exponential form of the number 125.

5^3 means 3 factors of 5 or $5 \times 5 \times 5$

The Laws of Exponents:

#1: Exponential form: *The exponent of a power indicates how many times the base multiplies itself.*

$$x^n = \underbrace{x \cdot x \cdot x \cdots x \cdot x \cdot x \cdot x}_{n\text{-times}}$$

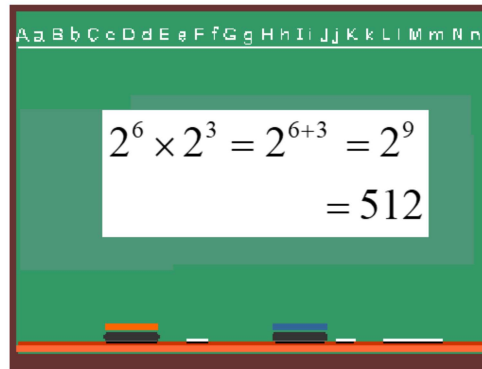
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n factors of x

Example: $5^3 = 5 \cdot 5 \cdot 5$

#2: Multiplying Powers: *If you are multiplying Powers with the same base, KEEP the BASE & ADD the EXPONENTS!*

$$x^m \cdot x^n = x^{m+n}$$

So, I get it!
When you
multiply
Powers, you
add the
exponents!



Practice

1. $A^5 \times A^3 =$

2. $3A^2 \times 2A^4 =$

3. $4A^2B \times 5A^3B^6 =$

#3: Dividing Powers: *When dividing Powers with the same base, KEEP the BASE & SUBTRACT the EXPONENTS!*

$$\frac{x^m}{x^n} = x^m \div x^n = x^{m-n}$$

So, I get it!

When you divide Powers, you subtract the exponents!



A green chalkboard with a whiteboard in the center. The whiteboard contains the mathematical calculation: $\frac{2^6}{2^2} = 2^{6-2} = 2^4 = 16$. The chalkboard has a wooden base with two erasers on it. At the top of the chalkboard, there is a small banner with the alphabet: Aa Bb Cc Dd Ee Ff Gg Hh Ii Jj Kk Ll Mm Nn.

Practice

1. $A^5 / A^3 =$

2. $4A^6 / 2A^4 =$

3. $6A^5B^6 / 2A^3B^2 =$

Try these:

1. $3^2 \times 3^2 =$

2. $5^2 \times 5^4 =$

3. $a^5 \times a^2 =$

4. $2s^2 \times 4s^7 =$

5. $(-3)^2 \times (-3)^3 =$

6. $s^2t^4 \times s^7t^3 =$

7. $\frac{s^{12}}{s^4} =$

8. $\frac{3^9}{3^5} =$

9. $\frac{s^{12}t^8}{s^4t^4} =$

10. $\frac{36a^5b^8}{4a^4b^5} =$

SOLUTIONS

● 1. $3^2 \times 3^2 = 3^{2+2} = 3^4 = 81$

2. $5^2 \times 5^4 = 5^{2+4} = 5^6$

3. $a^5 \times a^2 = a^{5+2} = a^7$

4. $2s^2 \times 4s^7 = 2 \times 4 \times s^{2+7} = 8s^9$

5. $(-3)^2 \times (-3)^3 = (-3)^{2+3} = (-3)^5 = -243$

● 6. $s^2t^4 \times s^7t^3 = s^{2+7}t^{4+3} = s^9t^7$

SOLUTIONS

$$7. \frac{s^{12}}{s^4} = s^{12-4} = s^8$$

$$8. \frac{3^9}{3^5} = 3^{9-5} = 3^4 = 81$$

$$9. \frac{s^{12}t^8}{s^4t^4} = s^{12-4}t^{8-4} = s^8t^4$$

$$10. \frac{36a^5b^8}{4a^4b^5} = 36 \div 4 \times a^{5-4}b^{8-5} = 9ab^3$$

More Practice