Power Up With Exponents

Make equivalent expressions with exponent rules

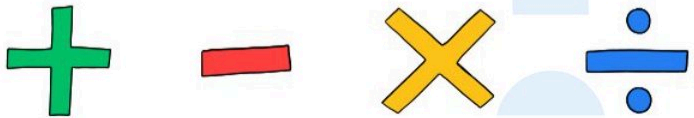


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Think, pair, share

What does 2^3 mean? Is 2^3 x 2^2 = 2^6?



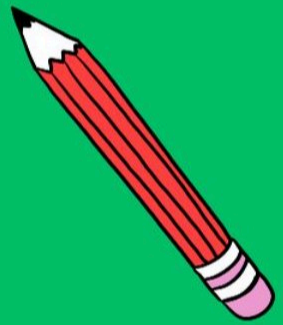


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$a^2+b^2=c^2$

DID YOU KNOW?

Any nonzero number to the zero power is 1.

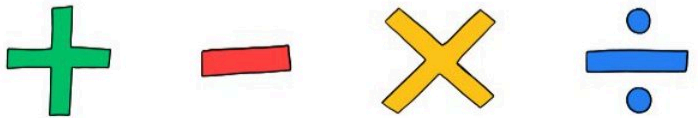


So 5^0 = 1, and even 2,340^0 = 1.

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Why do we add exponents?

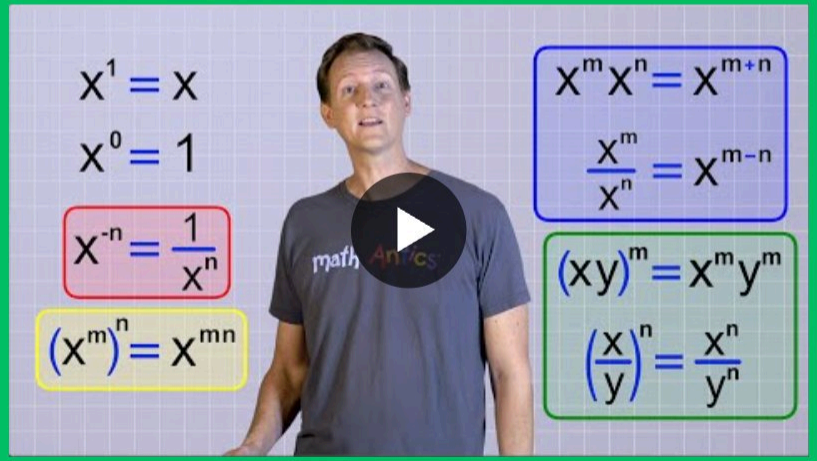
$2^3 \times 2^2 = (2\times2\times2) \times (2\times2)$ → Count the factors: five 2s multiplied → So it equals 2^5: add exponents!



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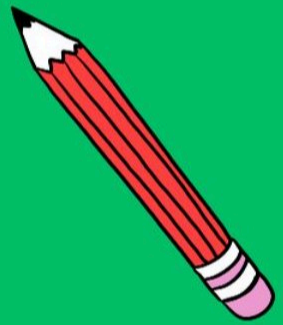
$a^2+b^2=c^2$

Watch: Multiply and Divide Powers



▶ 0:00 – 4:00

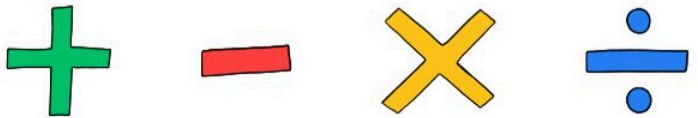
- Watch when to add exponents
- Watch when to subtract exponents
- Listen for power to a power



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Three moves to simplify

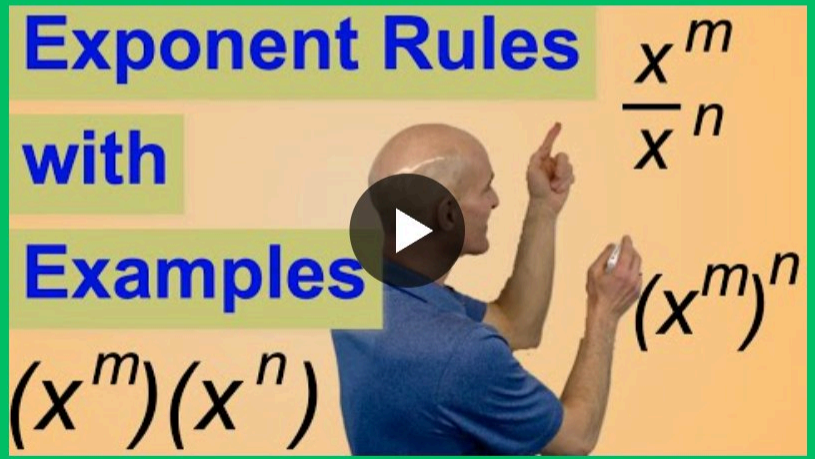
1. Same base multiply? Add exponents.
2. Same base divide? Subtract exponents.
3. Power to a power? Multiply exponents.
4. Fix zero and negatives last.



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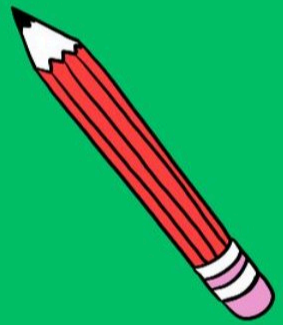
$a^2+b^2=c^2$

Watch: Rules in Action



▶ 0:00 – 4:30

- Spot zero and negative exponents
- Check how equivalents are written



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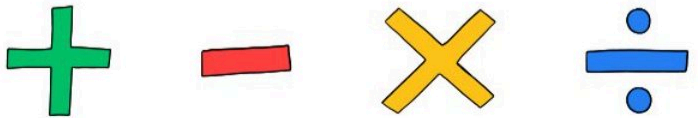
Your task

In pairs, rewrite each expression as one power.

1. Simplify: 5^3x5^4, 10^7/10^5, (2^3)^2, 3^-2
2. Write each as one equivalent power
3. Name the rule you used

10 min

In pairs



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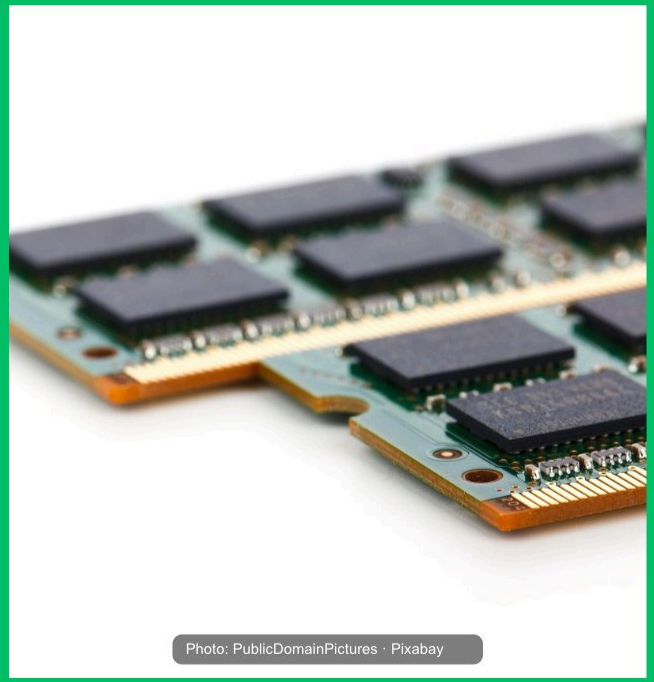
$a^2+b^2=c^2$

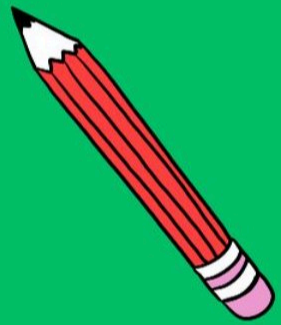
POWERS GET BIG FAST

1,024

layers, or bytes in a kilobyte

That is 2^10: just 10 doublings of 2.





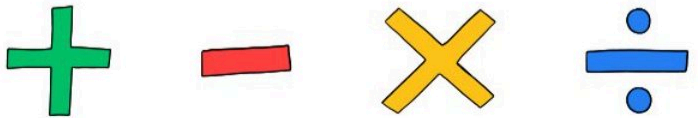
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Vote: trickiest rule?

Which rule trips you up most?

- **A** Adding when multiplying
- **B** Subtracting when dividing
- **C** Multiplying power to power
- **D** Zero and negative exponents

Vote with your hands, then explain why.



$a^2+b^2=c^2$

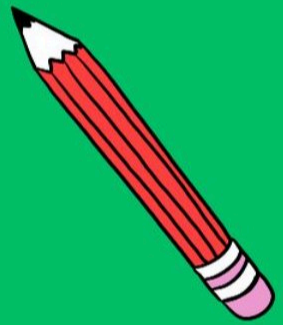
True or false?

3^4 x 3^2 = 3^6

(2^3)^2 = 2^5

7^0 = 1

4^-1 = -4



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