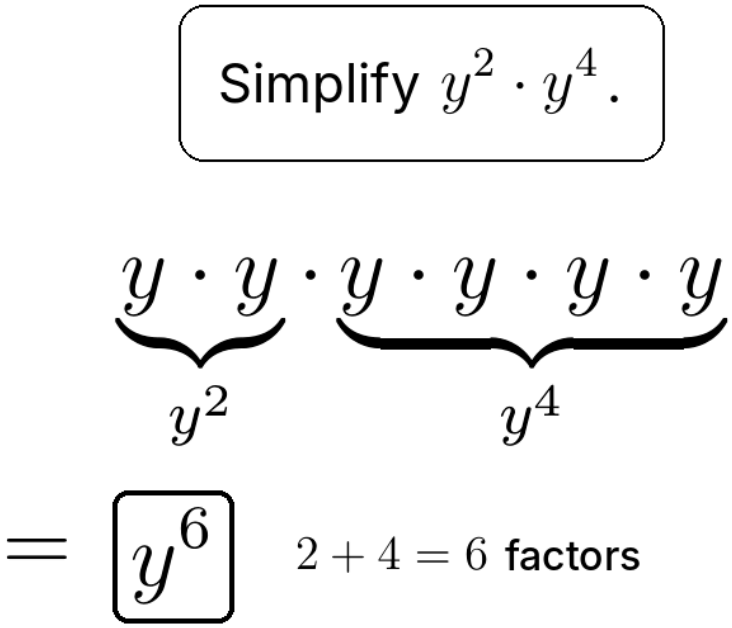
Count the Factors

EX04-V1 · storyboard · EX04 Multiply powers of the same base. Read each picture with its sentences.

Picture 1



1. Simplify y² times y⁴.
2. Write it out: two y's, then four more.
3. That is six factors of y: y⁶.
4. Two plus four is six.

Picture 2

Simplify $(v^3)^5$.

$$v^3 \cdot v^3 \cdot v^3 \cdot v^3 \cdot v^3 \quad \text{5 copies of } v^3$$

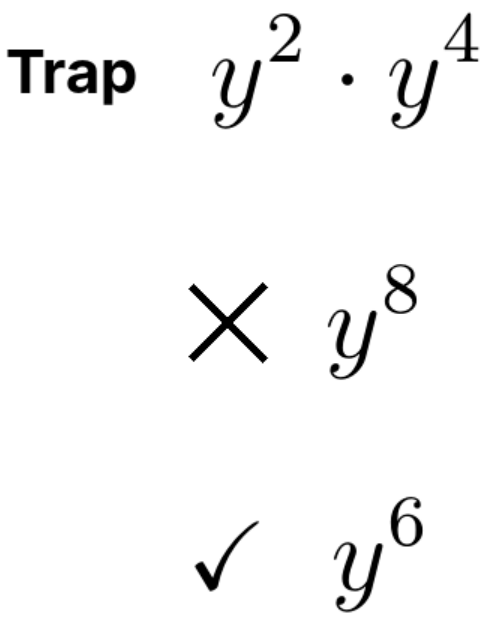
$$= \boxed{v^{15}} \quad 3 \times 5 = 15$$

The two rules

$$a^b \cdot a^c = a^{b+c} \qquad (a^b)^c = a^{bc}$$

5. Now v cubed, all to the fifth power.
6. That is five copies of v^3.
7. Five groups of three factors: three times five is fifteen.
8. v^{15}.
9. So multiplying powers of the same base adds the exponents, and a power of a power multiplies them.

Picture 3



10. Watch for the trap: multiplying the exponents in a product.
11. y^2 times y^4 is not y^8.
12. Count them: six factors, y^6.