Simplification

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Simplification in multiplication refers to making multiplication problems easier by breaking them down into smaller, simpler steps. This involves using properties of multiplication and simplifying numbers before multiplying.

Example:

Instead of multiplying 25×4 directly, we can break it down to $20 \times 4 + 5 \times 4$ to make the process simpler.

Steps for Simplification

- 1. Look for numbers that can be broken down into smaller parts (e.g., 25 = 20 + 5)
- 2. Multiply each part separately
- 3. Add the results to get the final answer
- 4. For fractions, simplify by multiplying the numerators and denominators separately

Properties Used

Commutative Property: The order of numbers in multiplication does not change the product.

Associative Property: Grouping numbers differently does not change the product.

Distributive Property: $a \times (b + c) = a \times b + a \times c$

Multiplicative Identity: Any number multiplied by 1 remains the same.

Example 1:

Question: Simplify and multiply 25 × 6

Solution:

Step 1: Break 25 into 20 + 5

Step 2: Multiply $20 \times 6 = 120$

Step 3: Multiply $5 \times 6 = 30$

Step 4: Add the results 120 + 30 = 150

Answer: $25 \times 6 = 150$

Example 2:

Question: Simplify and multiply $\frac{3}{4} \times 8$

Solution:

Step 1: Write 8 as 4 × 2

Step 2: Multiply $\frac{3}{4} \times 4 = 3$

Step 3: Multiply $3 \times 2 = 6$

Answer: $\frac{3}{4} \times 8 = 6$

Summary Points

• Simplification helps break down complex multiplication into simpler steps

• Use properties like distributive and associative to make multiplication easier

• For fractions, simplify by multiplying numerators and denominators

• Simplifying makes solving problems faster and more efficient