



# Simplifying Terms (Multiplying and Dividing)

Watch out for these combinations in algebra that might catch you out:

$a \times a = a^2$  and not  $2a$ . Powers tell you **how many** letters are multiplied together –

so  $x^5 = x \times x \times x \times x \times x$

$abc = a \times b \times c$  and  $3a$  means  $3 \times a$

The multiplication symbol ( $\times$ ) is often left out to make it clearer.

$ab^2 = a \times b \times b$  (Only the  $b$  is squared; not the  $a$  as well).

$\frac{a}{b} = a \div b$

When we **multiply** algebraic expressions, **combine** the **numbers first**, then the letters.

For example:

$$4a \times 7w$$

$$4 \times 7 = 28$$

$$a \times w = aw$$

$$\text{Answer} = 28aw$$

When we **divide** algebraic expressions, **divide** the numbers.

For example:

$32b \div 8b$  (You may also see this written as  $\frac{32b}{8b}$  but you will still follow the same method).

$$32 \div 8 = 4$$

$$b \div b = 1$$

$$\text{Answer} = 4$$

When we **multiply** the **same** letters, combine them by **adding** their powers together.

For example:

$$6x^2 \times 5x^4$$

$$6 \times 5 = 30$$

$$x^2 \times x^4 = x^{2+4}$$

$$\text{Answer} = 30x^6$$

When we **divide** the **same** letters, **divide** the numbers first, then combine the letters by **subtracting** the powers.

For example:

$$8x^5 \div 2x^3$$

$$8 \div 2 = 4$$

$$x^5 \div x^3 = x^{5-3}$$

$$\text{Answer} = 4x^2$$



Your Turn

Simplify the following:

1.  $5a \times 2$

\_\_\_\_\_

2.  $12 \times 4x$

\_\_\_\_\_

3.  $2y \times 4y$

\_\_\_\_\_

4.  $3s \times 2s$

\_\_\_\_\_

5.  $7a \times 2a \times a$

\_\_\_\_\_

6.  $40x \div 5$

\_\_\_\_\_

7.  $35x \div 7$

\_\_\_\_\_

8.  $\frac{121d}{11}$

\_\_\_\_\_

9.  $\frac{72a}{8}$

\_\_\_\_\_

10.  $165t^2 \div 15t$

\_\_\_\_\_

Simplify the following:

1.  $5t \times 6t^3$

\_\_\_\_\_

2.  $6a^2 \times 5a^3$

\_\_\_\_\_

3.  $9t^4 \times 4t^3$

\_\_\_\_\_

4.  $6k^5 \times 11k^8$

\_\_\_\_\_

5.  $45z^3 \div 5z$

\_\_\_\_\_

6.  $14n^4 \div 7n^2$

\_\_\_\_\_

7.  $24a^5 \div 3a^4$

\_\_\_\_\_

8.  $56b^6 \div 7b^3$

\_\_\_\_\_

Challenge:

Simplify each expression:

$9a^6g^7 \times 3a^4g^8$

\_\_\_\_\_

$96m^7n^2 \div 12m^3n^6$

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