

Simplifying expressions

For an unknown number x , the **expression** $2x + 3$ means '2 lots of x with 3 added' or 'add 3 to 2 lots of x '. '2 lots of x ' is the same as ' $2 \times x$ ' or ' $x + x$ ' and is written as $2x$.

Expressions that involve \times and \div should be simplified where possible.

Multiplying expressions

To multiply together two or more algebraic expressions, first multiply any number parts and then multiply the letters.



SNAPIT! Algebraic notation

$3a$ is used for $3 \times a$
 ab is used for $a \times b$
 a^2 is used for $a \times a$
 a^3 is used for $a \times a \times a$
 a^2b is used for $a \times a \times b$
 $\frac{a}{b}$ is used for $a \div b$



STRETCHIT!

When three algebraic expressions are multiplied together, the answer is $12t^3$. Write down the possible multiplied expressions.

WORKIT!

Simplify:

a $a \times a$

a^2

Use indices to show a letter multiplied by itself. a^2 is read as 'a squared'.

b $b \times b \times b$

b^3

Use indices to show the same letter multiplied together three times. b^3 is read as 'b cubed'.

c $2 \times j \times k \times 6$

$12jk$

Multiply the numbers together:
 $2 \times 6 = 12$

d $2d \times 4d$

$8d^2$

Multiply the letters together by writing them next to each other:
 $j \times k = jk$

Write the number in front of the letters.

Dividing expressions

Dividing algebraic expressions is similar to cancelling fractions. If necessary, write the division as a fraction first. Cancel any number parts where possible and then cancel any letters where possible.

Write the division as a fraction.
 Cancel the number parts by dividing the top and bottom by 2.

WORKIT!

Simplify:

a $6a \div 2$

b $12xy \div 4y$

$\frac{3\cancel{2}a}{\cancel{2}} = 3a$

$\frac{3\cancel{4}xy}{\cancel{4}y} = 3x$

This is the same as $\frac{12 \times x \times y}{4 \times y}$.

Cancel the number parts by dividing the top and bottom by 4.
 y appears on the top and bottom, so cancel.



CHECKIT!

1 Simplify:

a $p \times p \times p$

b $4 \times b \times c \times 7$

c $4a \times 3b$

d $5x \times 4x$

e $2g \times (-4g)$

f $2p \times 3q \times r$

2 Simplify:

a $10x \div 2$

b $\frac{14w}{-2}$

c $6p \div p$

d $8mn \div 2m$

e $\frac{12xy}{3y}$

f $9abc \div bc$