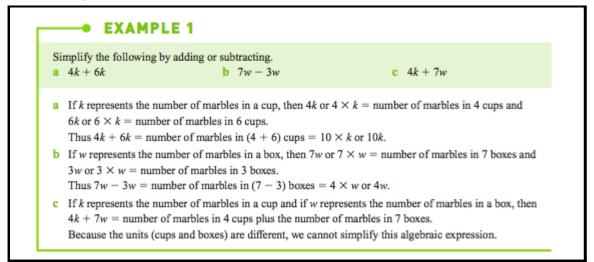
WALT adding and subtracting algebraic terms

Success Criteria I know that terms that are alike can be added

Basics of algebraic expressions



Important notes

Algebraic terms with different pronumerals (different units) are called unlike terms. Unlike terms cannot be added or subtracted. For example:

- 5a, 14a and 23a are like terms (same pronumeral a)
- 5a and 14a² are unlike terms (different pronumeral forms, a and a²)
- 5p, 14a²q and 73d are unlike terms (different pronumerals p, a²q, d)

Now give answers to this

b

f –

i i

The sum of ab and y

d 7 subtracted from 2y

Half of 1 more than x

Write an algebraic expression for each of the following.

- **a** The sum of 2 and x
- **c** 5 less than x
- The product of x and 3
- **g** Four more than twice x
- i 10 less than the product of 4 and x
- **k** The sum of 3 and y is divided by 2
- **m** The square of the sum of m and n
- **n** The sum of the squares of m and n

h The sum of x and y is divided by 5

3 lots of x subtracted from 1

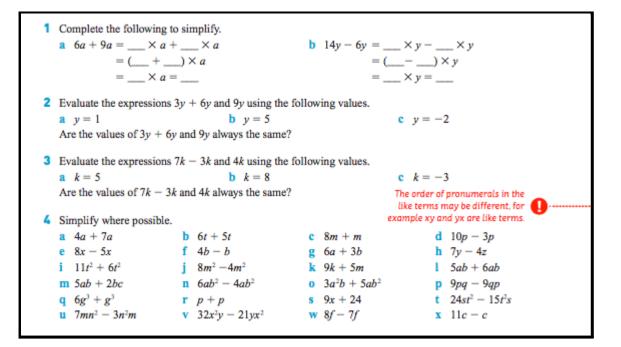
Three times the value of p

Sum (+)

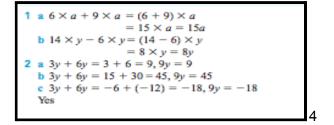
Product (x)

Twice (×2)

EXAMPLE 2 Simplify where possible. **b** 9w - 3wc 7x + 9wa 7x + 3xd 8y - ye 6k + 7 a $7x + 3x = 7 \times x + 3 \times x$ $= (7 + 3) \times x$ $= 10 \times x = 10x$ **b** $9w - 3w = 9 \times w - 3 \times w$ $= (9 - 3) \times w$ $= 6 \times w = 6w$ c 7x + 9w cannot be simplified as 7x and 9w are unlike terms. d $8y - y = 8 \times y - 1 \times y$ $= (8 - 1) \times y$ $= 7 \times y = 7y$ e 6k + 7 cannot be simplified as 6k and 7 are unlike terms.



Check Your Answers



	5 - 15 = 20, 4k = 5 - 24 = 32, 4k = 5 - (-9) = -12,	32
4 a 11a	b 11t	c 9m
d 7p	e 3x	f 3b
g 6a + 3b	h $7y - 4z$	i 17t ²
4m ²	k 9k + 5m	1 11ab
m 5ab + 2bc	$n 2ab^2$	$a^{3}a^{2}b + 5ab^{2}$
p 0	$q 7g^3$	r 2p
s 9x + 24	t 9st ²	u 4mn ²
$v 11x^2y$	w f	x 10c
p = 0 s = 9x + 24	$\begin{array}{c} \mathbf{q} & 7g^3 \\ \mathbf{t} & 9st^2 \end{array}$	r 2p $u 4mn^2$

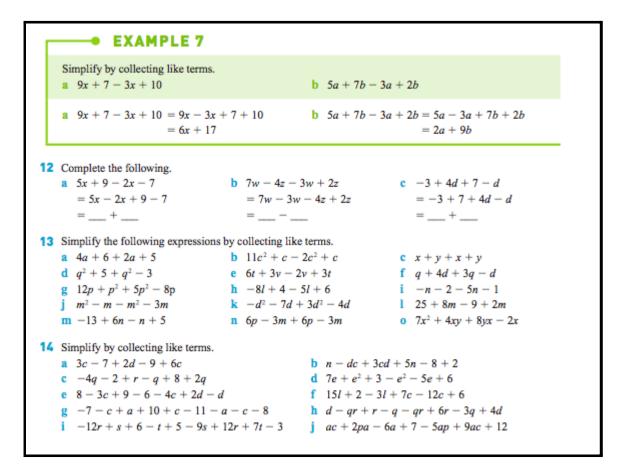
• EXAMPLE 4 Simplify the following. a -4f - 5f + 6fb qr - 8rq + 3rqThe term rq can be rearranged to qr. a -4f - 5f + 6f = -9f + 6f = -3fb qr - 8rq + 3rq = -7qr + 3qr= -4qr

D	2pq + 4pq - 3pq	с	2z - 6z + 3z
	= $- 3pq$		= + 3z
	=		=
b	8pq — 5pq — 6pq	c	c + 3c - 5c
е	-4m + m - 2m	f	18r - 2r - 7r
h	-3r + 2r - r	i	$4a^{2}b - 3a^{2}b - ba^{2}$
	$-d^2 + 7d^2 - 13d^2$	-	$k^2m - 5k^2m + mk^2$
	b e		= -3pq $= -3pq$ $=$

When collecting like terms remember to include the + or -EXAMPLE 5 sign in front of the like terms. Simplify the following by collecting like terms. a 6m - 7 + 2mb $4x^2y + 5p - 3yx^2$ a 6m - 7 + 2m = (6m + 2m) - 7b $4x^2y + 5p - 3yx^2 = (4x^2y - 3x^2y) + 5p$ = 8m - 7 $= x^2y + 5p$ 9 Complete the following to simplify. a 5y - 3 + 4y**b** 7p + 3q + 5p= (___ + ___) - 3 =(--+-)+3q= ____ - 3 = ____ + 3q 10 Simplify by collecting like terms. **c** 4 + 2n - n**a** 7 + 10 - 5m **b** 3a + 6 + 5a d 6 - 7q + 12 $\begin{array}{c} g \quad x^2y - 5 + 2yx^2 \\ k \quad 5 \\ \end{array}$ **f** 3f + 12 + 8fe 9 - 5k + 4 **h** 13w - 6 - 4wk 5x - 4x - 2o $d^2 + 5d^2 - 3d$ l p + 3p - 9p $4n - n + 2n^2$ i $a^2b + 9 + 11a^2b$ j $5q^2 - 6 + q^2$ **n** 7k - k - 6l $d^2 + 5d^2 - 3d$ m 6t + 4 - 5t**q** $3c + 2c^2 + 5c$ r $6 + 8n^2 - 5n^2$ s 11mn - 2m + 4nm t $5a^2b + 2ab^2 - 4a^2b$

EXAMPLE 6

Simplify by collecting like terms. **b** -2w - 9t - 5w **c** -6x - 3y + 2xa 8 + 4z - 10**a** 8 + 4z - 10 = 4z + 8 - 108 + 4z - 10 = -2 + 4zor = 4z - 2= 4z - 2**b** -2w - 9t - 5w = -2w - 5w - 9t or -2w - 9t - 5w = -9t - 2w - 5w= -7w - 9t= -9t - 7wc -6x - 3y + 2x = -6x + 2x - 3y= -4x - 3y (or -3y - 4x) 11 Simplify by collecting like terms. $\begin{array}{ccc} \mathbf{c} & 5m + 2n - 7m \\ \mathbf{g} & -5d + 4e + 3d \\ \mathbf{k} & -3y - 2w - y \end{array} \quad \begin{array}{ccc} \mathbf{d} & 2x - 8y - 5x \\ \mathbf{h} & -8z - 4w + 2z \\ \mathbf{l} & -6k + m + 2k \end{array}$ a 6 + 5k - 9 b 3 - 4s - 7 e 5t - 9t + 7u f 2a - 4b - 7ai -a - 3b - 2a j 6m - 8n - 2m



Check your answers

