Planner

Expressions

- Expanding single brackets in more complicated algebraic expressions
- Simplifying expressions by taking out common factors
- Adding, subtracting and multiplying algebraic expressions

Keywords

You should know

explanation 1a | explanation 1b | online

1 Copy and complete these multiplication grids.
Write an algebraic identity for each grid.

a

×	x	3
7		

b

×	$3a$	b
5		

c

×	p	$-5q$
3		

2 Expand the brackets in these expressions.

a $4(x + y)$ **b** $7(x + 3)$ **c** $4(3m + 4)$ **d** $9(4y - 6)$

e $4(6a + b)$ **f** $7(2a - b)$ **g** $9(x - 8y)$ **h** $12(4m + n)$

i $2(a + b)$ **j** $4(a + 2b)$ **k** $5(2v - w)$ **l** $3(d - 4c)$

3 Copy and complete these multiplication grids.
Write an algebraic identity for each grid.

a

×	$2x$	-6
$4x$		

b

×	$3u$	$-v$
-1		

c

×	a	$-b$
$-3a$		

4 Expand the brackets in these expressions.

a $a(a + 2)$ **b** $m(m - 5)$ **c** $p(3p + 2)$ **d** $2a(3a + 9)$

e $3m(2m + 3)$ **f** $4x(2x - 3y)$ **g** $5d(5d - 3e)$ **h** $3x(4y - 2x)$

5 Expand the brackets in these expressions.

a $-2(x + 3)$ **b** $-5(2y - 4)$ **c** $-9(3t + 4s)$ **d** $-2(3x - 4y)$

e $-3y(2y - 3)$ **f** $-p(p - 3q)$ **g** $-3n(2m + 4n)$ **h** $-4ab(a - b)$

explanation 2 — online

6 Expand the brackets in these expressions. Simplify where possible.

a $3(x + 1) + 2(x - 1)$

b $4(a + 3) + 5(a - 1)$

c $5(d - 4) + 4(3 + d)$

d $6(p - 3) + 3(p - 2)$

e $3(y - 2) - 2(3 + y)$

f $4(3 + x) + 5(2x - 2)$

g $4(2a - 3) + 6(a + 4)$

h $7(2m - 5) + 3(4m - 6)$

i $3(3y - 2) - 2(4y + 3)$

j $5(2m - 3) - 3(m - 2)$

k $4(3 + 2z) - 3(z + 2)$

l $6(4 + 5y) - (y - 2)$

m $3(x + y) - 2(x - y)$

n $3(p - q) + 2(2p + 3q)$

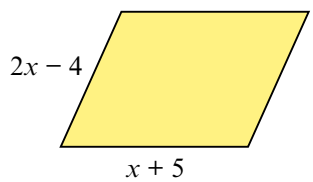
o $5(m + 2n) - (3m - n)$

p $4(6b - 3a) - 2(4a - 2b)$

explanation 3

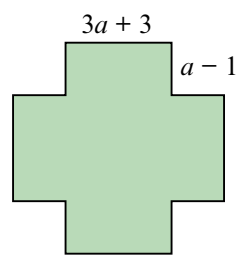
7 The perimeter of this shape can be written as $2(2x - 4) + 2(x + 5)$.

Expand the brackets and simplify the expression.



8 The perimeter of this shape can be written as $4(3a + 3) + 8(a - 1)$.

Expand the brackets and simplify the expression.



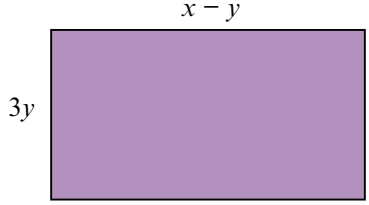
9 Look at the shapes.

i Write an expression for the perimeter of each shape. Use brackets.

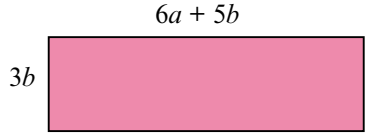
ii Write an expression for the area of each shape. Use brackets.

iii Expand the brackets in your expressions for **i** and **ii**.

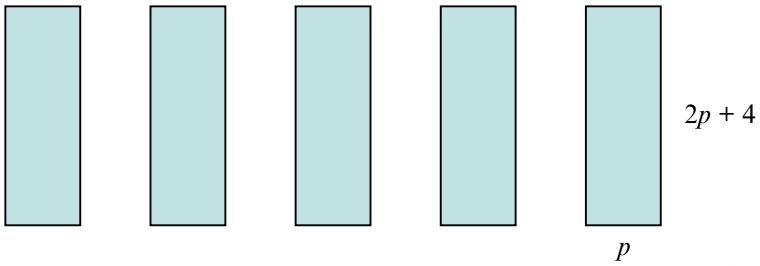
a



b

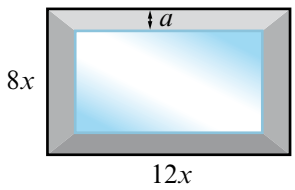


10 Write an expression for the combined area of these identical shapes and expand the brackets.



***11** Beth has bought a picture frame. The length and width of the picture frame are shown on the diagram. The edging has width a.

Write and simplify an expression for the perimeter of the picture which fits inside the frame.



explanation 4

12 Factorise these expressions. Check your answers by expanding the brackets.

a $2x + 4$	**b** $3y + 9$	**c** $16p + 8$	**d** $8a - 16$
e $28n - 14$	**f** $6x + 9$	**g** $25a - 10$	**h** $18 + 3n$
i $8 + 2x$	**j** $9 - 21p$	**k** $40 - 15a$	**l** $9y - 72$
m $20n + 16$	**n** $18 - 12a$	**o** $12 + 16b$	**p** $20 - 5m$
q $24 - 16p$	**r** $45 + 27q$	**s** $144 - 84x$	**t** $169 + 52y$

13 One of these expressions is not factorised fully. Which one is it?