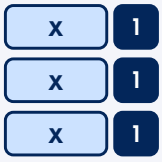
EXPAND A SINGLE BRACKET

BUILDING BLOCKS

NAME _____ CLASS _____ DATE _____

KEY IDEA

3(x + 1) means 3 lots of x + 1.



3 x tiles and 3 one tiles

3(x + 1) = 3x + 3

Multiply everything inside the bracket.

×	x	+ 1
3	3x	+ 3

1 Use the grid to work out 4 × 23 and 6 × 15. Add the parts to find the total.

a)

×	20	3
4		

= ____

b)

×	10	5
6		

= ____

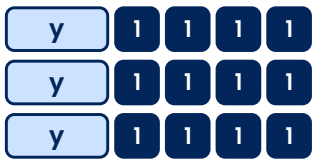
2 Count the tiles. Write each expression without a bracket.

a)



2(x + 3) = ____

b)



3(y + 4) = ____

3 This bar model shows 4 lots of m + 2.

m	2
m	2
m	2
m	2

a) How many m's? ____

b) How many 2s? ____

c) 4(m + 2) = ____

4 Now use the grid with algebra. Fill in the grid, then write the answer.

a)

×	x	+ 4
5		

5(x + 4) = ____

b)

×	2y	+ 1
3		

3(2y + 1) = ____

EXPAND A SINGLE BRACKET

SUPPORT

NAME _____ CLASS _____ DATE _____

KEY IDEA

Expand means multiply out the bracket.

Multiply every term inside by the number outside.

$4(3x + 2) = 12x + 8$

×	3x	+ 2
4	12x	+ 8

1 Complete each grid. Then write the expanded expression.

a)

×	x	+ 7
2		

$2(x + 7) =$ _____

b)

×	y	− 3
5		

$5(y - 3) =$ _____

c)

×	2a	+ 1
6		

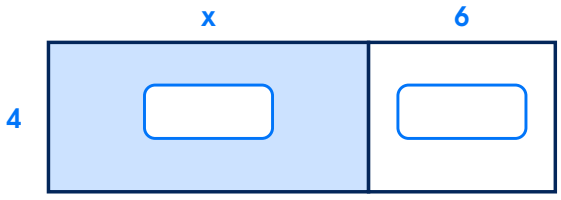
$6(2a + 1) =$ _____

2 Expand.

a) $3(m + 4)$ _____ b) $7(n - 2)$ _____ c) $2(5p + 3)$ _____

d) $4(2 - q)$ _____ e) $10(3r - 1)$ _____ f) $9(k + 1)$ _____

3 Write the area of each part of the rectangle. Then write the total area.



Total area = _____

4 Each of these is wrong. Write the correct expansion.

a) $5(x + 3) = 5x + 3$ Correct answer: _____

b) $2(x - 6) = 2x + 12$ Correct answer: _____

EXPAND A SINGLE BRACKET

CORE

NAME _____ CLASS _____ DATE _____

KEY IDEA

Multiply every term in the bracket by the term outside: $-3(2y - 5) \equiv -6y + 15$ and $a(a + 4) \equiv a^2 + 4a$. Take care with negative signs.

FLUENCY

1 Expand.

a) $6(3t + 5)$ ☐

b) $-2(x + 4)$ ☐

c) $-3(2y - 5)$ ☐

d) $a(a + 7)$ ☐

e) $4b(2b - 3)$ ☐

f) $x(y + z)$ ☐

2 Fill in the missing terms.

a) $5(\square + 2) \equiv 15x + 10$

b) $\square(2y - 7) \equiv 8y - 28$

c) $3(4m \square) \equiv 12m - 6$

d) $-2(\square) \equiv -6a + 4$

REASONING

3 Circle every expression that is equivalent to $6(2x + 1)$.

$12x + 6$ $12x + 1$ $3(4x + 2)$ $6x + 6$ $2(6x + 3)$ $12x + 7$

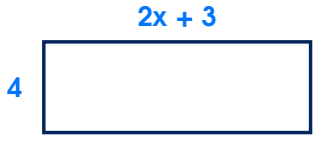
Explain why $12x + 1$ is not equivalent to $6(2x + 1)$.

.....

4 A rectangle is 4 wide and $2x + 3$ long. Kai says its area is $8x + 3$.

a) Is Kai right? Explain.

.....



b) Find the area when $x = 5$. ☐

EXPAND A SINGLE BRACKET

GREATER DEPTH

NAME _____ CLASS _____ DATE _____

REASONING

1 Is each statement always, sometimes or never true? Circle your answer.

If it is sometimes true, give an example of when it is true and when it is not.

a) $a(b + c) \equiv ab + ac$ — ALWAYS / SOMETIMES / NEVER

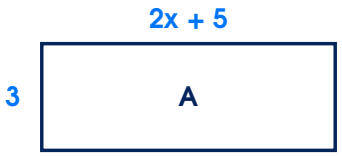
b) Expanding a bracket gives two terms. — ALWAYS / SOMETIMES / NEVER

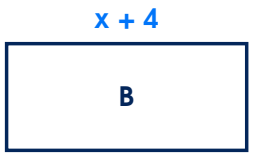
c) $-(x - 5) \equiv 5 - x$ — ALWAYS / SOMETIMES / NEVER

d) $k(x + 1) \equiv kx + 1$ — ALWAYS / SOMETIMES / NEVER

PROBLEM SOLVING

2 Write each area as an expanded expression.





a) Area A = _____

b) Area B = _____

c) Larger area when x = 2: _____

d) Larger area when x = 10: _____

3 Expand.

a) **2(a + 3b – 4)** _____

b) **–5(2x – y + 1)** _____

★ CHALLENGE FOR ALL

4 a) $6(2n + 3) \equiv 12n + 18$. Write $12n + 18$ in three other ways as a whole number multiplied by a bracket.

_____ _____ _____

b) Explain why $12n + 18$ is always a multiple of 6 but never a multiple of 12.

STEP 6 · EXPAND A SINGLE BRACKET

ANSWERS

BUILDING BLOCKS

1 a) 80, 12, so 92 · b) 60, 30, so 90
2 a) 2x + 6 · b) 3y + 12
3 a) 4 · b) 4 · c) 4m + 8
4 a) 5x, 20 so 5x + 20 · b) 6y, 3 so 6y + 3

SUPPORT

1 a) 2x + 14 · b) 5y − 15 · c) 12a + 6
2 a) 3m + 12 · b) 7n − 14 · c) 10p + 6 · d) 8 − 4q · e) 30r − 10 · f) 9k + 9
3 4x and 24, total area 4x + 24 (= 4(x + 6))
4 a) 5x + 15 · b) 2x − 12

CORE

1 a) 18t + 30 · b) −2x − 8 · c) −6y + 15 · d) $a^2 + 7a$ · e) $8b^2 - 12b$ · f) xy + xz
2 a) 3x · b) 4 · c) − 2 · d) 3a − 2
3 12x + 6, 3(4x + 2) and 2(6x + 3). 12x + 1 only multiplies the 2x by 6, not the 1 (6 × 1 = 6)
4 a) No: both terms must be multiplied by 4, so the area is 8x + 12 · b) 52

GREATER DEPTH

1 a) Always · b) Sometimes: 2(x + 3) gives two terms, 2(x + y + 3) gives three · c) Always · d) Sometimes: only when k = 1 (e.g. k = 2 gives 2x + 2)
2 a) 6x + 15 · b) $x^2 + 4x$ · c) A (27 > 12) · d) B (140 > 75)
3 a) 2a + 6b − 8 · b) −10x + 5y − 5
4 a) e.g. 2(6n + 9), 3(4n + 6), 1(12n + 18) · b) 12n + 18 ≡ 6(2n + 3), a multiple of 6. 12n + 18 ≡ 12n + 12 + 6 ≡ 12(n + 1) + 6, which is 6 more than a multiple of 12, so never a multiple of 12.