Planner

Simplifying expressions

- Identifying the correct order for calculations involving algebra
- Simplifying expressions by collecting like terms
- Expanding simple expressions involving brackets
- Writing expressions using index notation

Keywords

You should know

explanation 1a | explanation 1b | explanation 1c

1 Work these out.

a $\frac{4+6}{2}$ **b** $\frac{4}{2}+6$ **c** $4+\frac{6}{2}$

d $\frac{9-6}{3}$ **e** $\frac{9}{3}-6$ **f** $9-\frac{6}{3}$

2 Work these out.

a $2+3^2$ **b** 2^2+3^2 **c** $2(2+3)$

3 Which of these expressions is equivalent to $\frac{p+q}{r}$?

a $p \div r + q$ **b** $(p+q) \div r$ **c** $p + q \div r$

4 Look at these expressions. In what order are the operations carried out?

a $p+3q$ **b** p^2-11 **c** $2-\frac{q}{p}$ **d** $4(p+q^2)$

explanation 2a | explanation 2b | explanation 2c | online

5 Simplify these expressions. Collect like terms.

a $y+2y$ **b** $2x+4x+x$

c $3p+q+2p$ **d** $c+2d+4c-d$

e $6y-3z-8y+4z$ **f** $8m-2j+6m-3m-4j$

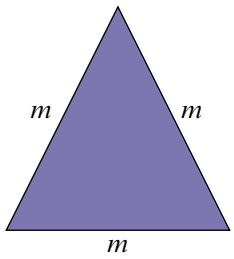
g $3s+6t+u+s-u-8t$ **h** $x+y+y-x-z+z$

i $3+a+4a$ **j** $5+3p+2p$

k $-4+m-2m+6$ **l** $-3+2a+2b+a-3-2b$

6 Write an expression for the perimeter of each shape. Simplify your answers.

a



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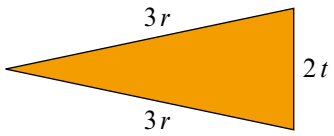

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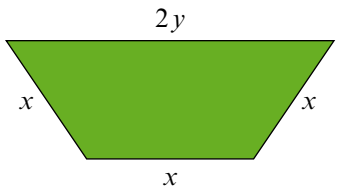

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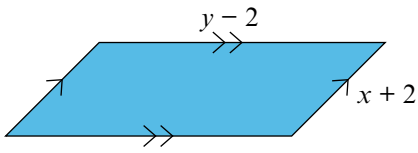

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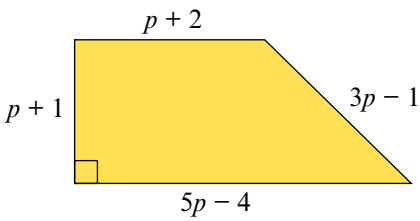

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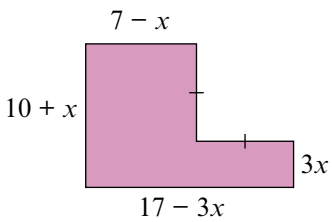


explanation 3a | explanation 3b | online

7 Expand each expression.

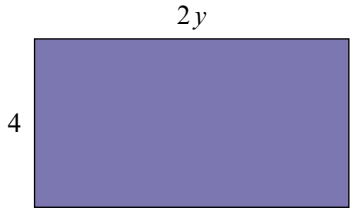
a $2(x + 1)$	**b** $3(5 + y)$	**c** $5(p + q)$
d $6(4a + 3)$	**e** $4(y - 2z)$	**f** $3(t - 3q)$
g $5(2m + 3n)$	**h** $6(3a - 2b)$	**i** $-4(2x - 4y)$
j $a(2 + b)$	**k** $p(4 - q)$	**l** $x(y + z)$
m $2m(2 + n)$	**n** $3g(2 + g)$	**o** $4p(p - 2q)$

8 Expand the brackets and simplify the expressions.

a $3m(a + 2) + 2m$	**b** $5x(y + 3) + 2xy - 1$
c $5a(x + y) + 2ax + ay$	**d** $\frac{1}{2}a(4m - 2n) + an$
e $k(p + q) + k(3p - q)$	**f** $5c(d + 2e) + 2c(3d + e)$
g $4p(2q - r) - 2p(q + r)$	**h** $x(y - z) - x(y + z)$

9 Write an expression for the area of each rectangle. Expand the brackets.

a



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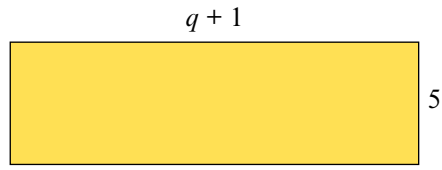

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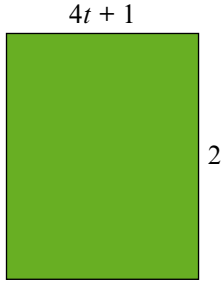

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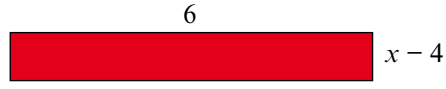
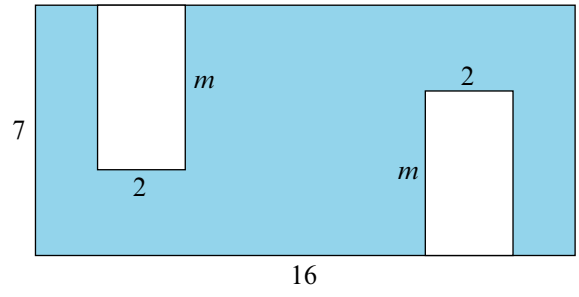


10 What is the area of the shaded part of the rectangle?



explanation 4a explanation 4b

11 Write these using index notation.

a $y \times y \times y$ **b** $r \times r \times r \times r$ **c** $p \times p \times p \times p \times p$

d $t \times t \times u \times u \times u$ **e** $y \times y \times y \times z$ **f** $a \times a \times b \times b \times c \times c$

g $m \times n \times n \times p \times p \times p$ **h** $d \times d \times d \times d \times e \times e$ **i** $s \times s \times t \times s$

12 Write these in full.

a t^2 **b** f^2g **c** b^3d^2 **d** y^4z^3 **e** $a^2b^2c^3$ **f** mn^3p^2

13 **a** Write each of these expressions in full.

i $a^4 \times b \times a$ **ii** $x \times y^2 \times x^3$ **iii** $p^3 \times q \times p \times q^2$

b Write each expression in part **a** as simply as possible using index notation.