



1 Simplify $a + a + a + a$

(1 mark)

There are four lots of a added together

$$a + a + a + a = 4a$$

$$4a$$

2 Simplify $7c - 2c + 4c$

(1 mark)

The coefficient is the number multiplying a letter. Add the coefficients of matching letter terms, just as 4 lots of an object plus 5 lots make 9 lots

All the terms are in c , so combine the coefficients

$$7 - 2 + 4 = 9$$

$$7c - 2c + 4c = 9c$$

$$9c$$

3 Simplify $6x + 3y - 2x + 5y$

(2 marks)

Like terms have exactly the same letters and powers. Combine x terms with x terms and y terms with y terms; an x and a y need not have the same value

Collect the x terms

$$6x - 2x = 4x$$

Collect the y terms

$$3y + 5y = 8y$$

The simplified expression is $4x + 8y$

$$4x + 8y$$

4 Simplify $5x - 3 - 2x + 7$

(2 marks)

x terms

$$5x - 2x = 3x$$

numbers

$$-3 + 7 = 4$$

$$3x + 4$$

5 Simplify $4p + 7 - 6p - 2$

(2 marks)

p terms

$$4p - 6p = -2p$$

numbers

$$7 - 2 = 5$$

$$\boxed{-2p + 5}$$

6 a. Simplify $4 \times 3h$

b. Simplify $9a + 2b - 3a + b$

(2 marks)

$$a) 4 \times 3h = 12h$$

b) Collect the a terms

$$9a - 3a = 6a. \text{ Collect the b terms: } 2b + b = 3b$$

b) The answer is $6a + 3b$

7 Simplify $7a + 2b - 3a - 5b + 4$

(2 marks)

a terms

$$7a - 3a = 4a$$

b terms

$$2b - 5b = -3b$$

$$\boxed{4a - 3b + 4}$$

8 Simplify $7pq - 2qp + 3pq$

(2 marks)

qp means the same as pq , so all three terms are like terms

$$7pq - 2pq + 3pq = 8pq$$

$$\boxed{8pq}$$

9 Simplify $(9y + 3y - 6y) \div 2$

(2 marks)

$$9y + 3y - 6y = 6y$$

$$6y \div 2 = 3y$$

$$\boxed{3y}$$

- 10 A rectangle has a length of $(3x + 2)$ cm and a width of $(x + 5)$ cm.
Write down and simplify an expression for the perimeter of the rectangle.

(3 marks)

$$= (3x + 2) + (x + 5) + (3x + 2) + (x + 5)$$

x terms

$$3x + x + 3x + x = 8x$$

numbers

$$2 + 5 + 2 + 5 = 14$$

$$\boxed{8x + 14}$$

- 11 a. Simplify $5 \times 2m$
b. Simplify $n \times n \times n \times n$
c. Simplify $3c \times 4d$

(3 marks)

$$a) 5 \times 2m = 10m$$

b) n multiplied by itself four times is n^4

c) Multiply the numbers

$$3 \times 4 = 12, \text{ then attach the letters: } 12cd$$

- 12 Simplify $3a^2 + 2a - a^2$

(2 marks)

a^2 terms

$$3a^2 - a^2 = 2a^2$$

$2a$ is a different term

$$\boxed{2a^2 + 2a}$$

- 13 a. Simplify $3 \times 4x + 2x$
b. Simplify $2m \times 3m + m^2$

(3 marks)

a)

$$3 \times 4x = 12x$$

$$12x + 2x = 14x$$

$$\boxed{14x}$$

b)

$$2m \times 3m = 6m^2$$

$$6m^2 + m^2 = 7m^2$$

$$\boxed{7m^2}$$

14

a. Simplify $8x + 5 - 3x + 2$ b. Simplify $2g \times 5g$

(3 marks)

a) Collect the x terms $8x - 3x = 5x$. Collect the numbers: $5 + 2 = 7$. Answer $5x + 7$

b) Multiply the numbers

 $2 \times 5 = 10$. Multiply the letters: $g \times g = g^2$. Answer $10g^2$

15

Solve $3x + 4x - 5 = 16$

(3 marks)

collect like terms

$$\begin{array}{rcl}
 7x - 5 & = & 16 \\
 +5 & & \\
 \hline
 7x & = & 21 \\
 \div 7 & & \div 7 \\
 \hline
 x & = & 3
 \end{array}$$

$$x = 3$$