1 (a) Simplify $w + w + w + w - w$

+4   −1

$4w - w = 3w$

$3w$ ①

(1)

(b) Simplify $4 \times a \times 2$

$4a \times 2 = 8a$

multiply integer parts : $4 \times 2 = 8$

$8a$ ①

(1)

(c) Simplify $f \times f \times f \times f \times f$

1 2 3 4 5

f^5 ← f 'to the power of 5'
means
f multiplied by itself
5 times

f^5 ①

(1)

(d) Simplify $4c + 4h + 5c - 6h$

Parts with the
same variable
(letter) can be
added / subtracted.

$4c + 5c = 9c$
$4h - 6h = -2h$ } $9c - 2h$

① ①

$9c - 2h$

(2)

(e) Factorise $10d + 15$

The highest common
factor of 10 and 15
is 5

$10 \div 5 = 2$ $15 \div 5 = 3$

$5(2d + 3)$

$5(2d + 3)$ ①

(1)

(f) Make t the subject of $e = 7t + g$

↑
write it as $t = $.

$e = 7t + g$

$-g ($ $e - g = 7t$ ①

$\div 7 ($ $\dfrac{e - g}{7} = t$

$t = \dfrac{e - g}{7}$ ①

(2)

(Total for Question 1 is 8 marks)

2 (a) Simplify $5c \times d$

5cd ①

(1)

(d) Simplify $8k + 5m - 2k + 6m$

8 k + 5 m - 2 k + 6m

8 k - 2k + 5m + 6m

6k + 11 m

6k + 11 m ②

(2)

(Total for Question 2 is 3 marks)

3 (a) Simplify $g^6 \times g^4$

$$g^{6+4} = g^{10} \quad ①$$

g^{10}

....

(1)

(b) Simplify $(3cd^4)^2$

$$3^2 \times c^2 \times d^{4 \times 2} \quad ①$$

$$= 9c^2d^8 \quad ①$$

$9c^2d^8$

....

(2)

(Total for Question 3 is 3 marks)

4   (a) Simplify $3r \times 5t$

$$3r \times 5t = 3 \times 5 \times r \times t$$
$$= 15rt$$

15rt ①

(1)

(Total for Question 4 is 1 marks)

5 (d) Simplify fully $\dfrac{n^4 \times n^7}{n^5}$ ①

$$\frac{n^4 \times n^7}{n^5} = n^{4+7-5} = n^6$$

n^6 ①

(2)

(Total for Question 5 is 2 marks)

6 (c) Simplify $(4pq^2)^3$

$$= 4^3 \times p^3 \times (q^2)^3$$

$$= 64 \times p^3 \times q^{2 \times 3} \text{ ①}$$

$$= 64 p^3 q^6 \text{ ①}$$

$64 p^3 q^6$

....

(2)

(Total for Question 6 is 2 marks)

7 (a)   Simplify $6m - 2k + 5m - k$

$6m + 5m - 2k - k$

$11m - 3k$ ②

....
$11m - 3k$

(2)

(Total for Question 7 is 2 marks)

$6m + 5m - 2k - k$

$11m - 3k$ ②

$11m - 3k$

8   (a) Simplify $10a \times b$

10 ab ①

(1)

(Total for Question 8 is 1 marks)

9 (a) Simplify $3 \times 10d$

$(3 \times 10) d$
$= 30 d$

.... $30 d$ ①

(1)

(b) Simplify $8e + e - 5e$

.... $4e$ ①

(1)

(Total for Question 9 is 2 marks)

10 (a) Simplify $w \times w \times w \times w \times w$

$$w^{1+1+1+1+1} = w^5$$

w^5 ①

(1)

(b) Simplify $5a \times 3c$

$$(5 \times 3) \times a \times c$$

$$= 15ac$$

$15ac$ ①

(1)

(c) Simplify $3e + 2f - e + 5f$

$$3e - e + 2f + 5f$$

$$= 2e + 7f$$

$2e + 7f$ ②

(2)

(d) Solve $5x - 7 = x + 12$
Show clear algebraic working.

$$5x - 7 = x + 12$$

$$5x - x = 12 + 7 \quad ①$$

$$4x = 19 \quad ①$$

$$x = \frac{19}{4}$$

$$= 4.75 \quad ①$$

$x =$ 4.75

(3)

(Total for Question 10 is 7 marks)

11 (a) Simplify $a \times a \times a \times a$

$a^{1+1+1+1} = a^4$ ①

a^4

....
(1)

(b) Simplify $4b \times 5c$

$(4 \times 5) \times b \times c$

$= 20bc$ ①

$20bc$

....
(1)

(c) Simplify $6d + 2e + d - 5e$

$6d + d + 2e - 5e$

$= 7d - 3e$ ②

$7d - 3e$

....
(2)

(Total for Question 11 is 4 marks)

12 (a) Simplify $(3k^2)^4$

$$3^4 \times k^{2 \times 4}$$

$$= 81 \times k^8$$

$$= 81 k^8$$

$81 k^8$ ②

....

(2)

(b) Simplify $(21m^4 n) \div (3n^{-5})$

$$(21 \div 3) \times (m^4) \times (n \div n^{-5})$$

$$= 7 \times m^4 \times (n^{1-(-5)})$$

$$= 7 \times m^4 \times n^6$$

$$= 7m^4 n^6$$

$7m^4 n^6$ ②

....

(2)

(Total for Question 12 is 4 marks)

13 (a) Simplify $10x + 4y + 3x - 6y$

$$= 10x + 4y + 3x - 6y$$
$$= 10x + 3x + 4y - 6y$$
$$= 13x - 2y \quad ②$$

$13x - 2y$

(2)

(Total for Question 13 is 2 marks)

14 (a) Simplify $(2x^3y^5)^4$

$$= (2x^3y^5)^4$$

$$= 2^4 \times x^{3\times4} \times y^{5\times4}$$

$$= 16 \times x^{12} \times y^{20}$$

$$= 16x^{12}y^{20} \quad ②$$

$16x^{12}y^{20}$
....

(2)

(Total for Question 14 is 2 marks)

15 (a) Simplify $6p + 2t + p - 3t$

$6p + p + 2t - 3t$

$7p - t$ ②

....$7p - t$.......................................

(2)

(Total for Question 15 is 2 marks)

16 (a) Simplify $a \times a \times a \times a \times a$

$a^{1+1+1+1+1} = a^5$

a^5 ①

(1)

(b) Simplify $8b \times 3c$

$(8 \times 3) \times b \times c$

$24bc$

$24bc$ ①

(1)

(Total for Question 16 is 2 marks)

17 (a) Simplify $12a + 3a - 7a$

$8a$ ①

(1)

(b) Simplify $8 \times 3b$

$(8 \times 3)b = 24b$

$24b$ ①

(1)

(c) Solve $\dfrac{c}{3} = 9$

$c = 9(3)$

$= 27$

$c =$ 27 ①

(1)

(Total for Question 17 is 3 marks)

18 (a) Simplify $12g - 8e - 5g + 6e$

$(12g - 5g) + (-8e + 6e)$

$\therefore 7g - 2e$

$7g - 2e$

② (2)

(Total for Question 18 is 2 marks)

19 (a) Simplify $c \times c \times c \times c \times c \times c$

c^6 ①

(1)

(b) Simplify $2h^3 + 5h^3 - h^3$

$6h^3$ ①

(1)

(c) Expand $x(x + 5)$

$x^2 + 5x$ ①

(1)

(d) Factorise $9y - 12$

$3(3y - 4)$

$3(3y - 4)$ ①

(1)

Rosanna sells m small bags of marbles and p large bags of marbles.

Each small bag contains 15 marbles.
Each large bag contains 40 marbles.

The total number of marbles that Rosanna sells is T
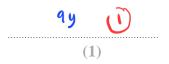
(e) Write down a formula for T in terms of m and p

Small : 15 m

large : 40 p

Total, T = 15m + 40p

$T = 15m + 40p$ ③

(3)

(Total for Question 19 is 7 marks)

20 (a) Simplify $3c + 5d - c + 2d$

$$3c - c + 5d + 2d = 2c + 7d$$

$2c + 7d$ ②

....

(2)

(b) Simplify $8e \times 5f$

$$8 \times 5 \times e \times f = 40\,ef$$

$40\,ef$ ①

....

(1)

(c) Solve $5r - 3 = 8$

$$5r = 11 \ ①$$

$$r = \frac{11}{5} = 2.2 \ ①$$

$r = $ $\underset{}{2.2}$

....

(2)

(Total for Question 20 is 5 marks)

21 (a) Simplify $10y - y$

$9y$ ①

(1)

(b) Simplify $3p \times 4p$

$12p^2$ ①

(1)

(e) Simplify $8c + 5d - 2c - 3d$

$8c - 2c + 5d - 3d$

$6c + 2d$

$6c + 2d$ ②

(2)

(Total for Question 21 is 4 marks)

22 (a) Simplify $w^{12} \div w^3$

$w^{12-3} = w^9$

w^9 ①

(1)

(b) Simplify $5m^4p^2 \times 2m^3p$

$5 \times 2 \times m^{4+3} \times p^{2+1}$

$= 10 \, m^7 p^3$

$10 \, m^7 p^3$ ②

(2)

(Total for Question 22 is 3 marks)

23 (a) Simplify $5p \times 9k$

$$5 \times 9 \times p \times k$$
$$= 45pk$$

45pk ①

....

(1)

(b) Simplify $3e + 2f + 8e - 7f$

$$3e + 8e + 2f - 7f$$
$$= 11e - 5f \quad ②$$

11e − 5f

....

(2)

(Total for Question 23 is 3 marks)

24 (a) Simplify $c \times c \times c \times c \times c$

$$c^{1+1+1+1+1} = c^5$$

c^5 (1)

(1)

(Total for Question 24 is 1 marks)

25 (b) Simplify $(3a^2b^4)^3$

$$3^3 \times a^{2(3)} \times b^{4(3)} \quad ①$$

$$= 27a^6b^{12} \quad ①$$

$$27a^6b^{12}$$

....

(2)

(Total for Question 25 is 2 marks)

26   (a) Simplify $6a \times 2c$

$$12\,ac \quad ①$$

(1)

(b) Simplify $4d + 3e + d - 5e$

$$4d + d + 3e - 5e$$
$$= 5d - 2e$$

$$5d - 2e \quad ②$$

(2)

(c) Solve $4x - 7 = 23$

$$4x = 30 \quad ①$$
$$x = \frac{30}{4} = 7.5 \quad ①$$

$$x = \underline{\quad 7.5 \quad}$$

(2)

(Total for Question 26 is 5 marks)

27 (a) Simplify $p + p + p + p$

$$4p \quad ①$$

....

(1)

(b) Simplify $5e + 6f + 7e - 2f$

$$5e + 7e + 6f - 2f$$

$$= 12e + 4f$$

$$12e + 4f \quad ②$$

....

(2)

(Total for Question 27 is 3 marks)