

Simplifying Calculations and Expressions

Section 1 – Working with one number

Simplify each calculation/expression into a more concise form.

1. $3 + 3 + 3 + 3 + 3$	2. $4 + 4 - 4 + 4 + 4 - 4 + 4$	3. $5 + 5 - 5 - 5 - 5 - 5 - 5$
4. $t + t + t + t + t + t + t$	5. $g + g + g - g - g - g + g$	6. $p - p + p + p - p - p - p$

1. $4 \times 6 + 7 \times 6$	2. $20 \times 7 - 8 \times 7$	3. $4 \times 3 + 5 \times 3 - 3$
4. $9m + 8m$	5. $3f - 7f$	6. $4m - 2m + 5m - m - m$

1. $5^2 + 5^2 + 5^2 + 5^2$	2. $7^3 + 4 \times 7^3$	3. $6 \times 8^5 + 4 \times 8^5 - 8^5$
4. $w^4 + w^4 + w^4$	5. $8m^3 + 6m^3 + m^3$	6. $3y^6 + 4y^6 - 8y^6$

Section 2 – Identifying like terms

Decide if the two terms are *like terms* and write an expression to describe their sum (simplify where possible)

Term 1	Term 2	Like terms?	Sum
a	a		
a	2		
a	$3a$		
a	b		
b	c		
$2a$	$2b$		
a^2	a		
a^2	a^2		
xy	yx		
ac	ab		
a	$-2a$		
$3ab$	$4ba$		
$2a$	$-2a$		
$3a$	$-2a$		
a^2	$2a$		
a^2b	b^2a		
a^2	$-a^2$		

Section 3 – More than one number

1. $6 + 6 + 5 + 5 + 5 + 6 + 8$	2. $3 + 3 - 2 + 3 - 2 - 2$	3. $12 - 13 - 13 - 13 - 12 - 13$
4. $a + a + b + a + b + a + b$	5. $t + t - t - s - s - s - t$	6. $x^2 + x - x - x + x^2 + x^2$

1. $4d - 2q + 5d + 7c - 8$	2. $4r^2 - 5r - 7r^2 + 4r + 3r^2$
3. $4f^2 + 7h^2 - 2f^2 - 5h + 2h^2$	4. $6p^6 - 3p^5 - 5p^6 + 2p^5 - p^7$

1. $ab + a + b + ab + a + b + ab$	2. $3ab + 4a - 5b + 4ba$
3. $6a^2b + 2ab^2 + 3ab$	4. $3xyz + 2zxy + 5zyx + 3yzx$

Section 4 – Simplifying Practice

Simplify these expressions

- | | | |
|----------------------------|-------------------------------|------------------------------|
| a. $3a + 2b + 4a + b$ | g. $2y + 4 + 3y - 1$ | m. $3a - 2b + a - 5b$ |
| b. $7y + 5y + 2h + 2h$ | h. $8 + 3w - w - 3$ | n. $2x - 2y - 6x + 5y$ |
| c. $g + 8a + 2a + g$ | i. $5 - 4s - 2 + 10s$ | o. $y - 4m - 3y - 5m$ |
| d. $7m + 7p + 8m + p + 2p$ | j. $3x + 6y + 5x - 2y$ | p. $7p - 2q - q + 3r + 4r$ |
| e. $9e + 2 + e + 2$ | k. $6m - 2s + 11s + m$ | q. $11c + 8d - 6c - 11d$ |
| f. $4 + 3a + 2a + 8$ | l. $2a + 3b - 2 + a + 3b + 4$ | r. $p - 4 - q - 3p - 9q + 3$ |

- (a) $2h^2 - 7h + 2h^2 - h + 6 + 4h - 9h$ (b) $-3n^2 + n + 4 + 7n^2 - 9n - 5$
 (c) $9x^2 - 7x^2 + 4x^2 - x + 4x^2 - 3x^2$ (d) $-5a^2 - 6ab + 7a^2 + 3ab - 2 - 8ab + 7$
 (e) $7ac - 3ab + 9ab - 7ac$ (f) $3y^2 - 4ab - 7y^2 - ab$ (g) $-xy + 20xy^2 - 27xy + 5x^2y$
 (h) $4ab - 6ab + 3a^2b + 4ab^2 + 5a^2b$ (i) $5a^3 - 6a + 7a^2 - 8a^3 - 3a + 5a^2 - 12 + 11a + 4$
 (j) $3x^2y - 16xy + 5xy^2 + 2x^2y - 13xy + 4xy^2 + 2xy + 11xy^2 + x^3y$
 (k) $5y^5 + 4y^4 + 3y^3 - 6y^2 + 8 - 7y^3 + 11 - 6y^3$
 (l) $10c^2d^2 + 6cd^3 - 3c^2d + 5c^2d^2 - 4cd^3 + 3c^2d^2$

Section 5 – Differences

	Expression 1	Expression 2	Difference (Expression 1 – Expression 2)	Difference (Expression 2 – Expression 1)
e.g.	$8x + 9y$	$2y + 3x$	$(8x + 9y) - (2y + 3x)$ $= 5x + 7y$	$(2y + 3x) - (8x + 9y)$ $= -5x - 7y$
a	$6y + 4x$	$2x + 3y$	$(\quad) - (\quad)$ $=$	$(\quad) - (\quad)$ $=$
b	$5p + 4q$	$3q + 2p$		
c	$7r - 2s$	$6s - r$		
d	$2v + w$	$w - 2v$		
e	$2x - y - 3z$	$-y - 8x$		
f			$(x - y - z) - (z - x - y)$	