Algebra

Algebraic language; conventions

1. Explain what each rule means for the number sequence next to it.

	Rule	Number sequence	Explanation
a)	3^n	3; 9; 27; 81	
b)	$x + 4$	14; 15; 16; 17; ...	
c)	$-10m$	–40; –50; –60; –70; –80	

Tip

We use algebraic language to help us with patterns. Variables and constants make up algebraic language.

2. Sipho has a new password for his Internet banking. **47pqb3s20t**

a) Underline all the variables. **b)** Circle all the constants.

3. Repeat the instructions above for the following two formulae:

a) $P = 2l + 2b$ **b)** $A = \frac{1}{2} \times b \times h$

4. Fill in the missing values: One packet of sweets costs q rand.

a) Three packets will cost _____ rand.

b) _____ packets will cost $15q$ rand.

c) p packets will cost _____ ran.

5. Charmaine is now c years old.

a) Five years ago she was _____ years old. **b)** _____ years ago she was $c - b$ years old.

c) In seven years' time, she will be _____ years old.

6. Write in algebraic language.

a) The sum of three times a certain number and 10. _____

b) The number of hours in y days. _____

c) The difference between the square of m and the cube root of n. _____

d) The quotient if a certain number is divided by 17. _____

7. Consider the algebraic expression: $3y^2x - 5 + 2x \times 3y + 1y^3 \div a8$

a) Rewrite and correct the expression according to mathematical conventions.

_____

b) How many terms are in the expression? _____

c) Write down the constant term. _____

d) Write down the cube root of the last term if $y = 2$ and $a = -1$. _____

Algebra

Terms; coefficients; exponents

Example

1. $2a = a + a$ OR $2 \times a$ 2. $(2a)^2 = (2a) \times (2a)$ 3. $x^3yz = x \times x \times x \times y \times z$

Consider the algebraic expression: $2z^4 - 17 + 3z^2 - 8z^3 - z$

1. Write down:

a) the number of terms in the expression

b) the coefficient of z in the fourth term

c) the constant term

d) the exponent of z in the first term

e) the sum of all the coefficients in the expression

f) the term where z has an exponent of 2

g) the value of the last term if $z = -1$

h) the expression re-arranged in ascending powers of z.

2. Consider the algebraic expression: $\frac{2a + 3b}{a - 5} + (7a - 1)a$

a) How many terms are in the algebraic expression?

b) Write down the all the variables in the expression.

c) For what value of a will the first term be undefined?

3. In each row cross out the term that does not fit in with the other terms.

a)	$5def$	$10efd$	$15fde$	$17def$	$20de$
b)	$2(a)(a)(b)(b)$	$3 \times ab \times ab$	$-7a^3b^2$	$11a^2b^2$	$-5b^2a^2$
c)	$-10mn^7k^3$	$60n^7k^3$	$50k^3m^0n^7$	$-20 \times 4k^3n^7$	$40k^3n^7$
d)	$4p^2q^2$	$-8q^2p^2$	pq^2p	$-3p^2q^3$	$9(pq)^2$
e)	$\frac{r}{t^2}$	$-21r \div t - t$	$\frac{3r}{t \times t}$	$\frac{-r}{9t^2}$	$15r \div (t \times t)$

4. Rewrite each term where necessary. Identify like terms by circling or underlining them.

Example

$3za + 2x - 1y + x5 + 2 \times 5az + 4y = \underline{\underline{(3az)}} + \underline{2x} - \underline{y} + \underline{5x} + \underline{\underline{(10az)}} + \underline{\underline{4y}}$

a) $4x^2 + 8x - 12 + 8 \times 2 \times x - 20 \times x \times x$

b) $-5(y)(y)(y)(y) + 10y^2 - 15y^4 + 4 \times 5 \times y \times y + 25$

c) $7 \times (-5) \times m \times n \times m \times n - 28m^2n + (-3)(-7)mn^2 + 14n^2m^2$