# SHARP

## Worksheet 8: Algebraic Expressions (Term 2)

### Grade 8 Mathematics

1.  Identify the constants in each of these expressions:

    a)  $3x^2 + 5 + 6x - 7y$

    b)  $56xy + 82y^2 - 13x - 15$

2.  Identify the variables in each of these expressions:

    a)  $5x^2y^3 + 6z - 9p$

    b)  $5x^5 + 8x^4 + 3x^3 - 7x^2 + 8$

3.  Given the following expressions:

    a)  $6x^2y - 7xy^3 + 8xy - 9$

    b)  $11mn + 12m^2n^2 - 15m^3 + 3n^3 + 12$

    c)  $11ab^3 - 16a^2b + 4a^3b$

    For each of the given expressions answer the following questions:

    i)    How many terms are in the expression?

    ii)   Give the coefficient of:

        a)  $y^3$            b)  $m$            c)  $a^2$

    iii)  Give the constant for each expression.

    iv)   What is the degree of each expression?

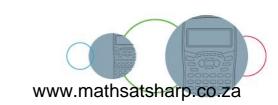    v)    Find the value of each expression if

        a)  $x = 3, \quad y = -3$

        b)  $m = 2, \quad n = -1$

        c)  $a = -2, \quad b = 2$

4. Simplify the following expressions

a) $4x(3x + 7) - 8x(2x - 4)$

b) $y(3y^2 - 8xy + 4x^2) + 3x(2y - 4xy)$

c) $6(5x - 12) - 9x(2x^2 - 3x + 7)$

d) $y^2(4y^2 - 8) - 4y(y^3 + 6y)$

e) $y(8x + 3y - 4) - (3x + 7y^2)$

f) $4x^2y(3xy - 7x^2 + 8y^2) - 3xy^2(12xy - 8)$

g) $11xyz(3x + 4y - 12z) + 3x^2yz$

h) $8xy^2(7x^2y - 3xy) + 3(4x^3y^3 - 7xy^3)$

i) $\frac{1}{2}xy(8xy + 12x^2 - 14y^2) - 3x^2(7y^2 - 11xy)$

j) $\frac{1}{3x}(6xy + 12x^2y) - \frac{1}{4y}(16y^2x + 24x^2y^2)$


5. Simplify the following expressions

a) $\frac{15x^3 + 35xy^2 - 45x^2y}{5x}$

b) $\frac{13xy - 26x^2y + 39x}{13xy}$

c) $\frac{-64t^3 + 48t^2 - 16t}{8t^2}$

d) $\frac{5x^2y + 20xy - 15}{20}$

e) $\frac{16x^2 - 8x^2}{4x^2 - 1}$

f) $\frac{16x^3 - 8x^2 + 24x^4}{5x^3 + 3x^3}$

g) $\frac{6a^4b^2 + 12a^2b^4 - 18a^2b^2}{2ab(3ab)}$

h) $\frac{18x^2y^2 - 36x^4y^2 + 54x^2y^4 - 63xy}{3x^2(-3y^2)}$

i) $\frac{-81x^2y^2 + 21x - 15xy + 18x^3y + 9}{9xy - 12xy}$

j) $\frac{24x^3y + 64xy - 36y^2}{15x^2 - 9x^2 + 2x^2}$


6. Simplify the following expressions

a) $(4xy^2)^2 + \sqrt[3]{-27x^6}$

b) $\sqrt{9x^2y^4 + 16x^2y^4}$

c) $\sqrt[3]{(5x^2yz^3)^3}$

d) $\sqrt{64a^6b^{12}} + \sqrt[3]{64a^6b^{12}}$

e) $3x(\sqrt{9x^4}) + 3x(\sqrt[3]{-27x^6})$


7. If $a = -4$, $b = 1$ and $c = \frac{2}{3}$, find the value of each of these expressions

a) $3abc + 1$

b) $4a^2 + 7b - 6c + 9abc^2$

c) $6a + b(3a - 6c) + 12$

d) $\sqrt{9a^2c - ab}$

e) $\frac{3a + 12b^2 - c}{a}$