

SHARP

Algebraic Expressions Investigation Memo

Grade 8 Maths

1. Complete the table given below using the table on your calculator.

X	Ans 1	Ans 2
-15	5	-15
-5	5	-5
0	5	0
1	5	1
3	5	3
20	5	20
50	5	50
x	5	X

- a) What can we say happened in the first Ans column?

The answer never changed, it always stayed the same, or constant.

- b) Why did this happen?

Because there was nothing that affected it in any way.

- c) What is the special name that we give to numbers that don't change?

Constants

- d) What can we say happened in the second Ans column?

The value changed as the X changed.

- e) Why did this happen?

Because we substituted or used the value that was given for X each time in the Ans column.

- f) What is the special name that we give to letters that represent other values?

Variables

2. From the question above identify each of the following as a constant or a variable:

- | | |
|-------------------|-------------------|
| a) 5 - constant | b) c – variable |
| c) 2y – variable | d) -10 – constant |
| e) 10x - variable | f) 7m - variable |




3. Based on the above, answer the following questions:

- a) What do you notice about the first sum (5X) and the second sum (5X²)?

The answers are different.

- b) Using the same technique, say whether the following are the same or different:

- | | |
|---------------------------------------|---|
| i) 4X and 4X ³ - different | ii) -2X ² and -2X ³ – different |
| 4X = 16 and 4X ³ = 256 | -2X ² = -32 and -2X ³ = -128 |
| iii) 6X and 6X - same | iv) 7X and 7(X) – same |
| 6X = 24 and 6X = 24 | 7X = 28 and 7(X) = 28 |

- c) Store the value of 3 into Y (so press   ). Now, say whether the following are the same or different:

- | | |
|----------------------------|---|
| i) 4XY and 4YX - same | ii) 4X ² and 4Y ² – different |
| 4XY = 48 and 4YX = 48 | 4X ² = 64 and 4Y ² = 36 |
| iii) 5XY and XY x 5 - same | iv) 4X ² Y ² and (2XY) ² – same |
| 5XY = 60 and XY x 5 = 60 | 4X ² Y ² = 576 and (2XY) ² = 576 |

- d) From your results in questions b) and c), answer the following questions:

- i) Which examples gave the same results?

For question b) questions iii) and iv).

For question c) questions i) iii) and iv).

- ii) Why do you think that they gave the same results?

Because although they were written in slightly different ways, they meant the same thing. The two examples were alike in terms of coefficients and variables and exponents.

iii) Which examples gave different results?

From question b) questions i) and ii)

From question c) question ii).

iv) Why do you think that the results were different?

The variables or exponents on the variable were not the same, and that changed the answer.

v) Do you think the results would have changed if we had substituted different numbers or values into X and Y?

No, because the variable and exponents would still have been different.

vi) From the above, how do we then define “like” terms?

Like terms are terms that have the same variables with the same exponents on them.

vii) From the above, how do we define “unlike” terms?

Unlike terms are terms that either do not have the same variables, or have the same variables but have different exponents.