Simplifying expressions – W/C 22ⁿᵈ June 2020

As you should know from my notes for W/C 11ᵗʰ May an Expression is a collection of terms joined together by + or -

Collecting like terms

Collecting '**like terms**' means to simplify terms in expressions in which the variables are the same. In the expression 5a + 2b + 3a – 6b the terms 5a and 3a are like terms (so we collect together the a's) and 2b and -6b are like terms (so we collect together the b's – remember not to forget the signs that are in front of each term)

Example 1

Simplify b + b + b + b

Adding the four 'like terms' together gives 4b.

Example 2

Simplify 5m + 3m – 2m

In this expression, all the terms are 'like terms' as the variable in each term is m. Simplify the expression in order:

5m + 3m = 8m

8m – 2m = 6m

Example 3   *This represents 1c but in Algebra we do not write the 1 in*

Simplify: We collect together all of the c's and d's and the numbers
        9c – 7d + c + 3d + 5   9c + c = 10c
    = 10c - 4d + 5   -7d + 3d = - 4d
                               There are no other numbers so the 5 stays as it is.

Example 4

Simplify: Again, we can only combine the 'like terms'

   $2p^2 + 3p + p^2$ p^2 is not like p so we can't add them
                                            together!
= $3p^2 + 3p$

Algebraic expressions can be added and subtracted by collecting like terms, but expressions can also be multiplied and divided.

Example 5

Simplify: a x a

Multiplying a number or letter by itself is called squaring. This means a x a = a^2 (read as 'a squared').

Example 6

Simplify: b x b x b

In this example, b is being multiplied by itself three times. The power of b will be three

So, b x b x b = b^3 (we say 'b cubed')

Example 7

Simplify: 3d x 5d   first multiply the numbers and then the letters

         = $15d^2$

We can also simplify expressions by dividing. I always think this is easier if you write it as a fraction and then treat as you would simplify a fraction (divide the top and the bottom by the same thing!)

Example 8

Simplify $16e^2 \div 2e$

Rewrite as: $\dfrac{16e^2}{2e} = \dfrac{16 \; \cancel{e} \; e}{2 \; \cancel{e}} = 8e$ 16÷2 = 8

                                                                              Top and bottom have also been divided by e

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Task 1: Make sure you have familiarised yourself with the vocabulary from W/C 11th May and have carefully read through the notes above.

Task 2: Watch the following mathswatch clips

Simplifying – Addition and subtraction – **clip 33**

Simplifying – Multiplication UP TO 4 minutes and 9 seconds! – **clip 34**

Then please work through the mymaths lessons (each section) to learn about division and to help with your understanding of what you have just watched above: When you are on mymaths: **Select : GCSE 9-1 England, Algebra, Algebraic manipulation, simplifying.**

Task 3: Work through the **worksheet** (sent separately) – writing the question and answers in your book

Make sure you understand the difference between x and +. You can only + or – 'like terms'.   If the multiplying confuses you miss out Q1f & Q8 (you should be able to do the others!)

For Questions 3 and 4 write all the steps in your book.

e.g. 3b) 5(2x + y) +3(5x + y)

       =10x + 5y + 15x + 3y

       =25x + 8y

If you are not happy about expanding the brackets – go back to notes of 11th May again ….. just watch those signs. If there is a negative number outside of the brackets everything in the bracket will change sign when you expand the brackets.

e.g. 3 d)   2 (2c + d) – 4 (c + d)

       = 4c + 2d – 4c – 4d

       = - 2d   -4 x d = -4d

Task 4: Complete the **mathswatch assignment**. Watch out for BODMAS – which sneaks into a couple of questions! Remember you are unable to have another attempt at the multiple-choice questions – so try and get them right first time!! Good Luck!