M9

Simplifying Polynomials

4.2

- To simplify a polynomial is to **collect like terms.**
- To collect like terms is the same as to combine like terms.

Like terms have same letter and exponents or Constant terms

Task 1: In each row, circle terms that are like.

$-x^2$	$-5x$	$0.89x^2$	$-x^3$	-10^2	y^2	$9x^2$
6	-0.67	$\frac{3^2}{5} = \frac{9}{5}$	$-ab$	-10^x	$6y^2$	$-6x^2$
ab	$-3a$	$7ab^2$	$-ab$	$-25ba$	$8abc$	$9ac^2$
$-x^2yz^5$	$6x^2z^5y$	$0.5yx^2$	$-x^2$	$10x^2yz^5$	y^2z^5x	$9zy^5x^2$

Task 2: Simplify by collecting like terms.

$2x + 24 - 13x - 10$

$= (2x - 13x) + (24 - 10)$

$= -11x + 14$

$-2x^3 + 24x - 3x + 10x^3 + 8$

$= (-2x^3 + 10x^3) + (24x - 3x) + 8$

$= 8x^3 + 21x + 8$

$-1a + 2b + 5b - 4 + 20a + 1$ $-1a + 20a + 2b + 5b - 4 + 1$ $19a + 7b - 3$	$0.6y + 2.4 - 3.2y - 2.4y + 1.3$ $0.6y - 3.2y - 2.4y + 2.4 + 1.3$ $-5y + 3.7$

Evaluating Polynomials

- To evaluate a polynomial means to substitute a given value for the variable and carry out the operations following BEDMAS rules.
- **Collect like terms before substituting!**

Examples: Evaluate the given polynomial if $x = 3$ and $y = 4$

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

$2x^2 + 5x^2 + 1y^2 + 3x + 5x - 1y - 1y$

$7x^2 + 1y^2 + 8x - 2y$

Now Substitute!!

$= 7(3)^2 + 4^2 + 8(3) - 2(4)$

$= 7(9) + 16 + 24 - 8$

$63 + 16 + 24 - 8 \longrightarrow 95$

$x = 3$
$y = 4$

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

$= -1x^2 + 5x^2 - 8x^2 - 4x - 3y + 5y - 1y$

$= -4x^2 - 4x + 1y$

$= -4(3)^2 - 4(3) + 1(4)$

$= -4(9) - 12 + 4$

$= -36 - 12 + 4$

$= -44$

c) $21 - 5y + 3y^2 + 6 + 5y^2 + 5 - 3y$

$= 3y^2 + 5y^2 - 5y - 3y + 21 + 6 + 5$

$= 8y^2 - 8y + 32$

$= 8(4)^2 - 8(4) + 32$

$= 8(16) - 32 + 32$

$= 128 - 32 + 32$

$= 128$