

## Mathematics 9

### Section 5.6 - Multiplying & Dividing a Polynomial by a Monomial

#### Remember!!

- WHEN THERE IS A TERM OUTSIDE THE BRACKETS, WE MULTIPLY ALL TERMS WITHIN THE BRACKET BY THE TERM OUTSIDE

$$5(-7n + 2)$$

- WHEN TWO POWERS WITH LIKE VARIABLES ARE MULTIPLIED, WE MULTIPLY THE COEFFICIENTS AND ADD THE EXPONENTS.

$$(5n^3)(3n^2) = 15n^5$$

- WHEN TWO POWERS WITH LIKE VARIABLES ARE DIVIDED, WE DIVIDE THE COEFFICIENTS AND SUBTRACT THE EXPONENTS.

$$\frac{10n^5}{5n^3} = 2n^2$$

#### New!!

The skills we have learned in the past are what we use to solve the more complicated questions we encounter now. The rules are simply applied on a larger scale.

#### Multiplying

Instead of having just a constant out front of the brackets, we now have a power. We still multiply this power by each term inside the brackets and use the exponent laws to determine the final answer.

$$3n^3(4n^2 - 8n + 2)$$

if a power is multiplied by a constant, the result will have the variable

$$12n^3 - 24n^2 + 6n$$

Practice

$$a) 5n(4n^3 + 2n^2 - 9n + 6)$$

$$20n^4 + 10n^3 - 45n^2 + 30n$$

$$b) 4x^2(3x^2 - 5x - 1)$$

$$12x^4 - 20x^3 - 4x^2$$

$$c) -7y(2y^3 - 5y + 9)$$

$$-14y^4 + 35y^2 - 63y$$

$$d) (7g^2 - 4 + 5g)(2g)$$

$$14g^3 - 8g + 10g^2$$

$$14g^3 + 10g^2 - 8g$$

### Dividing

Instead of having just a constant on the bottom of our fraction, we now have a power. We still divide this power by each term in the numerator and use the exponent laws to determine the final answer.

$$\frac{8n^3 - 12n^2 + 4n}{2n}$$

remember the  $2n$  is divided by EACH term

$$\frac{8n^3}{2n} - \frac{12n^2}{2n} + \frac{4n}{2n}$$

$$4n^2 - 6n + 2$$

Practice

$$a) \frac{4y^2 - 12y}{4y}$$

$$y - 3$$

$$c) \frac{-10g^6 + 8g^5 - 12g^2}{2g^2}$$

$$-5g^4 + 4g^3 - 6$$

$$b) \frac{25n^3 - 15n^2 - 20n}{-5n}$$

$$-5n^2 + 3n + 4$$

$$d) (6x^3 - 9x^2 + 12x) \div (-3x)$$

$$-2x^2 + 3x - 4$$