

# Mathematics 9

## Section 5.5 - Multiplying & Dividing a Polynomial by a Constant

Without even knowing it, you have already done the multiplying a polynomial by a constant. The only new concept we will learn this class is how to divide a polynomial by a constant.

### Multiplying

When we multiply a polynomial by a constant, we use the distributive property. This is exactly the same as when we were subtracting polynomials and we had to multiply the  $-1$  into the second polynomial.

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

MULTIPLY THE TWO TERMS  
INSIDE THE BRACKETS BY 5.

$$-35n+10$$

$$-2(-n^2+6n-3)$$

MULTIPLY THE THREE TERMS  
INSIDE THE BRACKETS BY  $(-2)$ .

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

The most common pitfall is mistakes involving the negative signs! BE CAREFUL!!

### Practice

a)  $3(-w^2+3w-5)$   
 $-3w^2+9w-15$

b)  $-5(n^2+n)$   
 $-5n^2-5n$

c)  $12(2m^2-3m)$   
 $24m^2-36m$

d)  $(-6a^2-5a-7)(-5)$   
 $30a^2+25a+35$

P. 247 # 11 (notiles), 15, 18a  
(only mult.)  
\$19

## Dividing

When we divide a polynomial by a constant, we need to remember that ALL terms in the polynomial is divided by the constant.

$$\frac{6n+10}{2}$$

IMAGINE IT AS TWO SEPARATE ACTIONS.

$$\frac{6n}{2} + \frac{10}{2}$$

$$3n+5$$

$$\frac{-3a^2 + 15ab - 21b^2}{-3}$$

THINK OF IT AS THREE SEPARATE ACTIONS

$$\frac{-3a^2}{-3} + \frac{15ab}{-3} - \frac{21b^2}{-3}$$

$$a^2 - 5ab + 7b^2$$

The most common pitfall is mistakes involving the negative signs! BE CAREFUL!!

## Practice

a)  $\frac{4n^2 - 16n + 6}{2}$

$$\frac{4n^2}{2} - \frac{16n}{2} + \frac{6}{2}$$

$$2n^2 - 8n + 3$$

c)  $\frac{-6q^2 - 9}{3}$

$$\frac{-6q^2}{3} - \frac{9}{3}$$

$$-2q^2 - 3$$

b)  $\frac{6x^2 + 3x + 9}{3}$

$$\frac{6x^2}{3} + \frac{3x}{3} + \frac{9}{3}$$

$$2x^2 + x + 3$$

d)  $(25 - 5m) \div (-5)$

$$\frac{25}{-5} - \frac{5m}{-5}$$

$$-5 + m$$

P. 247 #13 (NO TILES), 14, 16,  
18a (DIVISION ONLY), 23