

## Section 3.7 – The Distributive Property

MPM1D

### Part 1: Do It Now

Write a simplified expression for the area of the rectangle:

Area of rectangle =



$$4x + 2$$

Remember:  $\text{Area} = \text{length} \times \text{width}$

*Before we can simplify the expression we need to learn the distributive property!*

### Distributive Property

$$a(x + y) = ax + ay$$

When you apply the distributive property, you are getting rid of the brackets by multiplying everything in the brackets by the term in front of the brackets.

**Example:**

$$5(4x + 2)$$

$$= 20x + 10$$

To apply the distributive property, I must multiply both terms in the bracket by 5.

### Part 2: Multiply a Constant by a Polynomial

Expand and simplify the following:

1)  $2(5x + 3)$

2)  $-2(7x - 4)$

**Note:** Make sure to include the negative sign when distributing the -2. Follow integer rules for multiplication.

$$3) -3(2x^2 - 5x + 4)$$

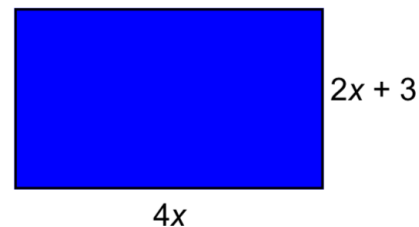
**Note:** You can also apply the distributive property to trinomials.

$$4) 2(6m - 3) + 3(16 + 4m)$$

**Remember:** You can collect like terms! Like terms have identical variables (same letters and exponents)

### **Part 3: Apply Our Knowledge**

Write an expression for the area of the rectangle in expanded form:



What is the area of the rectangle if  $x = 5$  cm?

### **Part 4: Distribute Variables**

**Example:**

$$\begin{aligned} x(x^2 - 3) \\ = x^3 - 3x \end{aligned}$$

**Remember the exponent laws:**

$$x(x^2) = x^{1+2} = x^3$$

$$6) x(x - 3)$$

$$7) -x(7x - 4)$$

$$8) -3x(2x^2 - 5x + 4)$$

$$9) 3m(m - 5) - (2m^2 - m)$$

For this question you can multiply the second polynomial by  $-1$  or use the properties for subtracting polynomials; both give the same result!

**10)**  $\frac{1}{2}(2w - 6) - \frac{2}{3}(9w - 6)$

**Part 5: Nested Brackets**

If there is a bracket inside of a bracket, simplify the inner most brackets first and then work your way out.

**11)**  $3[2 + 5(2k - 1)]$