

## Special Products

Team Name (optional):

Your Name:

Partner(s): 1.

(2.)

Our goal in this activity is as follows:

a) Use the area model to find some special products of the forms:

(i)  $(x + k)(x - k)$

(ii)  $(x + k)(x + k)$  or  $(x + k)^2$

(iii)  $(x - k)(x - k)$  or  $(x - k)^2$

b) Find a pattern that will enable you to find these types of products in one step without actually calculating the area.

**Task 1:** Products of the form  $(x + k)(x - k)$ . (Difference of Squares)

1. Find each product using the area model. Be sure to give your final answer in simplified form.

(a)  $(x + 2)(x - 2)$

	$x$	$+2$
$x$		
$-2$		

(b)  $(x + 3)(x - 3)$


(c)  $(x + 4)(x - 4)$


2. What pattern do you notice in the results for the problems above?

3. Use the pattern you noticed to help you find the following products without using the rectangles:

(a)  $(x + 5)(x - 5)$

(b)  $(x + 9)(x - 9)$

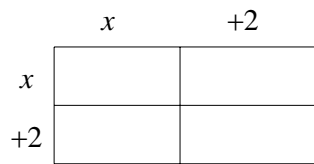
(c)  $(x + k)(x - k)$

4. Compare the results of multiplying  $(x + k)(x - k)$  and multiplying  $(x - k)(x + k)$ . Explain in terms of one of the properties of numbers how the results must be the same.

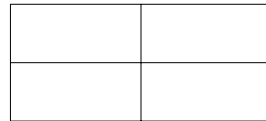
**Task 2: Products of the form  $(x + k)^2 = (x + k)(x + k)$  (Perfect Squares)**

1. Find each product using rectangles

(a)  $(x + 2)(x + 2)$



(b)  $(x + 3)(x + 3)$



(c)  $(x + 4)(x + 4)$



2. What pattern do you notice in the problems above?

3. Use the pattern you noticed to help you find the following products without using the rectangles:

(a)  $(x + 5)(x + 5)$

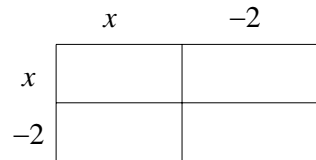
(b)  $(x + 9)(x + 9)$

(c)  $(x + k)(x + k)$

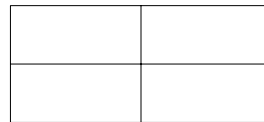
**Task 3:** Products of the form  $(x - k)(x - k) = (x - k)^2$  (More Perfect Squares)

1. Find each product using rectangles

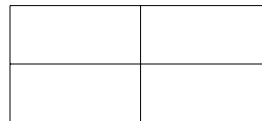
(a)  $(x - 2)(x - 2)$



(b)  $(x - 3)(x - 3)$



(c)  $(x - 4)(x - 4)$



2. What pattern do you notice in the problems above?

3. Use the pattern you noticed to help you find the following products without using the rectangles:

(a)  $(x - 5)(x - 5)$

(b)  $(x - 9)(x - 9)$

(c)  $(x - k)(x - k)$