

**Polynomial Patterns (Scaffolding Task)**

Name \_\_\_\_\_

Date \_\_\_\_\_

**GEORGIA STANDARDS OF EXCELLENCE**

**Perform arithmetic operations on polynomials**

**MGSE9–12.A.APR.1** Add, subtract, and multiply polynomials; understand that polynomials form a system analogous to the integers in that they are closed under these operations. (*Focus on polynomial expressions that simplify to forms that are linear or quadratic in a positive integer power of  $x$ .*)

**Interpret the structure of expressions**

**MGSE9–12.A.SSE.1a** Interpret parts of an expression, such as terms, factors, and coefficients, in context.

**STANDARDS FOR MATHEMATICAL PRACTICE**

- 2. Reason abstractly and quantitatively** by requiring students to make sense of quantities and their relationships to one another in problem situations.
- 7. Look for and make use of structure** by expecting students to apply rules, look for patterns and analyze structure.

The following activity is a modification from NCTM’s Illuminations Polynomial Puzzler <http://illuminations.nctm.org/LessonDetail.aspx?id=L798>

- 1. Can you find the pattern to the number puzzle below? Explain the pattern.

2	-6	-12
4	1	4
8	-6	-48

- 2. Now, use the pattern to complete this table.

3	?	-15
	-2	?
		240

HINT: Start with the question marks.

- 3. This can be expanded to multiplication with polynomials by solving the following:

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

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4. What about this one?

$-5$		$10x - 15$
$3x - 2$		
	$-8x + 12$	

5. Work the following on your own for 10 minutes, and then complete the tables with a partner.

a.

1	$x + 7$	
$-2x + 5$	2	

b.

	$x - 3$	
3	$-5x + 1$	
		$30x^2 - 96x + 18$

c.

$-4$		$-8$
	$2x - 6$	$-8x^2 + 72$

d.

$x + 3$		
2		$8x$
	$12x$	

e.

		$2x + 10$
$x + 3$	7	
$2x + 6$		

f.

6		
	$x + 3$	
18		$36x^2 + 144x + 108$