CHAPTER 5 Polynomials

Sec 5.1: Modeling Polynomials

Polynomial:

- an _____ contains one term or a sum of terms.
- The term(s) may contain variables (which will have whole number exponents).
- A term may be a number.

Example 1: $3x+1$

→ This polynomial has two _____. A _____ is a number, or a variable, or the product of numbers and variables. Terms are separated by + or -. Therefore, $3x$ is one term and 1 is another.

→ In the term, $3x$, the 3 is called the _____ . This is the number in front of the _____. x is the _____.

→ 1 is called the _____ . There is no variable attached to this number. It is the number in the expression that does not change.

Note

An algebraic expression that contains a term with a variable in the denominator, such as $\frac{3}{n}$, or the square root of a variable, such as $\sqrt{n}$, is not a polynomial.

Types of Polynomials

We classify a polynomial by its number of terms.

A _____ has 1 term. Examples:

A _____ has 2 terms. Examples:

A _____ has 3 terms. Examples:

Example 2: Complete the table

	$3x^2+2x-1$	$6xy-x^3$	$xy+6-z+2x^2$
variable(s)			
# of terms			
numerical coefficient(s)			
constant term			
classify the polynomial			

Equivalent Polynomials

Polynomials that have exactly the same terms, but the terms can be in a different order.

Example 3: Are the following polynomials equivalent? Explain why or why not?

a) $3x^2+2x-1$ and $2x+3x^2-1$

b) $3x^2+2x-1$ and $1+2x-3x^2$

Degree of a Polynomial

↳ The term with the greatest exponent.

Rules for determining the degree:

- The degree of a monomial is the sum of the exponents of its variables.

Monomial	Degree
$4x^2$	
$9ab$	
$-ax^2$	
15	

- The degree of a polynomial with one variable is the highest power of the variable in any one term.

Polynomial	Degree
$6x^2+3x$	
$7+x^2-x$	
$2-5y+8y^2+y^3$	

Example 4: Complete the table.

	$-3x^2+4x-5$	$3+2ab-b$	$-6-5x$
Coefficients			
Degree			
Constant Term			

The degree of a polynomial with two or more variables is the largest sum of the variables in any one term.

Polynomial	Degree
$x^2y^3+xy^4+xy^5$	
$3x^3y^4+7xy^3-2xy$	

Example 5: State the degree of each polynomial.

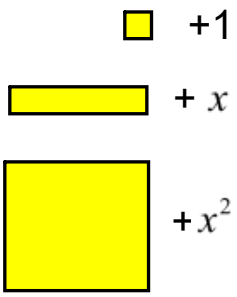
$9x^2y^2+3xy^3$	
$3x+2y-3z$	
$29n^3x+36n^3x^3$	

Modeling Polynomials

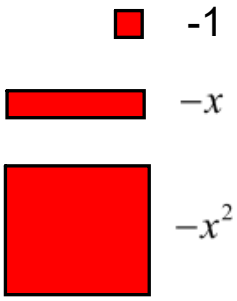
In algebra we use algebra tiles to model integers and variables.
The variable most commonly used is x, however, any variable can be used.

IN YOUR TEXTBOOK:

Yellow is Positive



Red is Negative



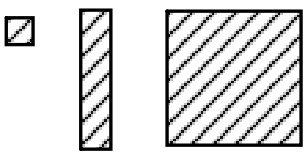
Note

Algebra tiles get their name from the area of their tiles.

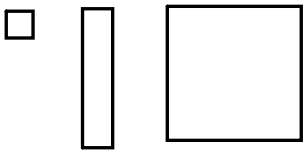
$$Area = length \times width$$

Be clear in your notes:

Shaded is Positive



Unshaded is Negative



Example 6: Use algebra tiles to model each expression.

a) $3x^2 - 2x + 5$

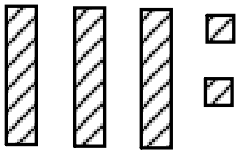
b) $x^2 + 3x - 6$

c) $2b^2 - b + 4$

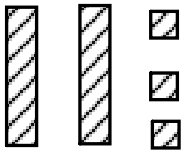
d) $5a - 3$

Example 7: Match the following polynomial to the appropriate diagram.

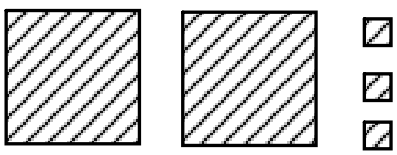
A: $2x^2 + 3$

(i) 

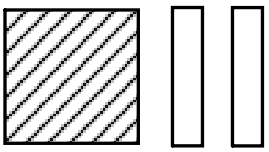
B: $3x + 2$

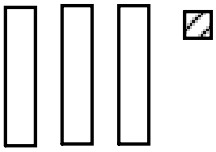
(ii) 

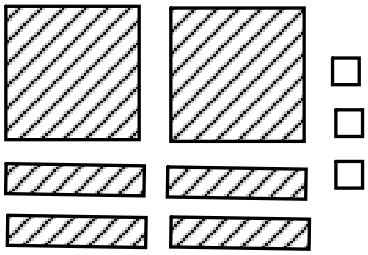
C: $2x + 3$

(iii) 

Example 8: Write a polynomial expression for each diagram.

a) 

b) 

c) 

Note:
A polynomial should be written in **descending order**. This means the exponent of the variable should decrease from left to right.

Example 9: Rearrange the following polynomials in descending order.

a) $-2p+4p^2-9$

b) $5x^2+7-8x$

c) $33+90c+100c^2$

Work Book Questions	Extra Practice Questions
p.214 - 215 #4abcdef, 5abcd, 6abcd, 7abcd, 9ace,11ace,13adeg,16	p.214 - 215 #8, 9bdf, 10, 11bdf, 12, 13bcfh, 14, 15, 17