

Algebra I  
Lesson 8-4

- I can find the degree of a polynomial.
- I can arrange the terms of a polynomial in ascending or descending order.

A polynomial is a monomial or a sum of monomials. Some polynomials have special names. A binomial is the sum of two monomials, and trinomial is the sum of three monomials. Polynomials with more than three terms have no special names.

Monomial	Binomial	Trinomial
7	$3 + 4y$	$x + y + z$
$13n$	$2a + 3c$	$p^2 + 5p + 4$
$-5z^3$	$6x^2 + 3xy$	$a^2 - 2ab - b^2$
$4ab^3c^2$	$7pqr + pq^2$	$3v^2 - 2w + ab^3$

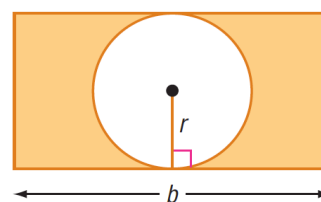
Expression	Polynomial?	Monomial, Binomial, or Trinomial?
$2x - 3yz$	Yes, $2x - 3yz = 2x + (-3yz)$ . The expression is the sum of two monomials.	binomial
$8n^3 + 5n^{-2}$	No. $5n^{-2} = \frac{5}{n^2}$ , which is not a monomial.	none of these
$-8$	Yes. $-8$ is a real number.	monomial
$4a^2 + 5a + a + 9$	Yes. The expression simplifies to $4a^2 + 6a + 9$ , so it is the sum of three monomials.	trinomial

Write a polynomial to represent the area of the shaded region.

$A = \text{area of shaded region}$

$$A = b(2r) - \pi r^2$$

$$A = 2br - \pi r^2$$



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

Monomial	Degree
$8y^4$	4
$3a$	1
$-2xy^2z^3$	$1+2+3 = 6$
7	0

$$7 = 7x^0y^0a^0b^0e^0$$

$$= 7 \cdot 1$$

The degree of a polynomial is the greatest degree of any term in the polynomial. To find the degree of a polynomial, you must find the degree of each term (monomial).

Polynomial	Terms	Degree of Each Term	Degree of Polynomial
$5mn^2$	$5mn^2$	3	3
$-4x^2y^2 + 3x^2 + 5$	$-4x^2y^2, 3x^2, 5$	4, 2, 0	4
$3a + 7ab - 2a^2b + 16$	$3a, 7ab, -2a^2b, 16$	1, 2, 3, 0	3

\*\*The terms of a polynomial are usually arranged so that the powers of one variable are in ascending or descending order.

Arrange the terms of each polynomial so that the powers of  $x$  are in ascending order.

$$7x^2 + 2x^4 - 11$$

$$7x^2 + 2x^4 + -11x^0$$

$$-11 + 7x^2 + 2x^4$$

$$2xy^3 + y^2 + 5x^3 - 3x^2y$$

$$2x^1y^3 + x^0y^2 + 5x^3 + -3x^2y$$

$$y^2 + 2xy^3 + -3x^2y + 5x^3$$

Arrange the terms of each polynomial so that the powers of  $x$  are in descending order.

$$6x^2 + 5 - 8x - 2x^3$$

$$-2x^3 + 6x^2 - 8x + 5$$

$$3a^3x^2 - a^4 + 4ax^5 + 9a^2x$$

$$4ax^5 + 3a^3x^2 + 9a^2x - a^4$$

$\pi$	$\pi$	$\pi$	$\pi$	$\pi$	$\pi$	$\pi$	$\pi$
$\pi$							$\pi$
$\pi$							$\pi$
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**Assignment:**

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