Algebra 1   8.1
Write <u>polynomials</u> in standard form
Add and subtract polynomials
monomial   var., number, product
polynomial
<u>bi</u>nomial (2)
✱ <u>tri</u>nomial (3)
degree (of a monomial)
degree (of a polynomial)
activ: algebra tiles
            whiteboards
            5 in a row

$$x^2 + 3x + {}^-7$$

$$n^3 + 5$$

Monomial	Binomial	Trinomial
$5x$	$2x^2 + 7$	$x^3 - 10x + 1$

yes

number
variable
product

no

variable in denom

$\sqrt{\text{var}}$

neg expon.

exponent

Degree	Name
0	6 constant
1	y^1 linear
2	n^2 quadratic
3	x^3 cubic

Polynomials are named based on their degree (exponents).and number of terms included

Example 1 Identify Polynomials

Determine whether each expression is a polynomial. If it is a polynomial, find the degree and determine whether it is a *monomial, binomial,* or *trinomial.*

Y-N

$x^2 + 5x - 7$ yes

d = 2

tri

Term or products of terms
No negative exponents
No exponents in denom

$3n + 5x - 2a^2 - 5$ yes

d = 2

poly.

$-a^5 + \dfrac{3}{n} + 6$ no

Expression
a. $4y$
b. -6.5
c. $7a^{-3} + 9b$
d. $6x^3 + 4x + x + 3$

Is it a polynomial? Degree Name

Y   1   mono

Y   0   mono

N

Y   3   poly

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1A. x

1B. $-3y^2 - 2y + 4y - 1$

1C. $5rx + 7tuv$ $d = 3$

$$2 \quad 3$$

1D. $10x^{-4} - 8x^a$

$$8x^2y - 3xy$$

$$3 \quad\quad 2$$

$$d = 3$$

$$\frac{5}{x^2} + 3n^4$$

leading coefficient

greatest degree

yes

Standard form: $4x^3 - 5x^2 + 2x + 7$

Standard form:
- degree from highest to lowest
- constant is always last

Example 2 Standard Form of a Polynomial

Write each polynomial in standard form. Identify the leading coefficient.

a. $3x^2 + 4x^5 - 7x$

$4x^{⑤} + 3x^{②} - 7x^1$

$Lc = 4$

b. $+5y - 9 - 2y^4 - 6y^3$

$-2y^4 - 6y^3 + 5y - 9$

$Lc = -2$

2A. $8 - 2x^2 + 4x^4 - 3x$

$4x^4 + 2x^2 + 3x + 8$

$LC = 4$

2B. $y + 5y^3 - 2y^2 - 7y^6 + 10$

$-7y^6 + 5y^3 + -2y^2 + y^1 + 10$

$LC = -7$

Algebra tiles

Terms

Like terms

Same shape

(exp)

Example 3 Add Polynomials

Find each sum.

a. $(2x^2 + 5x - 7) + (3 - 4x^2 + 6x)$

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

b. $(3y + y^3 - 5) + (4y^2 - 4y + 2y^3 + 8)$

$$3y^3 + 4y^2 + -y + 3$$

Activ: 5 in a row (if time)

GuidedPractice

3A. $(5x^2 - 3x + 4) + (6x - 3x^2 - 3)$ $= 2x^2 + 3x + 1$

3B. $(y^4 - 3y + 7) + (2y^3 + 2y - 2y^4 - 11)$ $= -1y^4$

$-3y$ $+2y$

$= -y^4 + 2y^3 - y + ^-4$

$LC = ^-1$

Distributive property

Example 4 Subtract Polynomials

Find each difference.

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

Danger!

b. $\left(7p + 4p^3 - 8\right) - \left(3p^2 + 2 - 9p\right)$

GuidedPractice

4A. $(4x^3 - 3x^2 + 6x - 4) - (-2x^3 + x^2 - 2)$

4B. $(8y - 10 + 5y^2) - (7 - y^3 + 12y)$