Polynomials

A *__polynomial__* is one term or the sum of terms whose variables have whole-number exponents.

No decimal

x^2

$a-2$

unknown number

Polynomials

Just like there are many different types of chairs, there are many different types of polynomials.

Monomials...

many

term or number

Monomials are polynomials with **ONE** term.

one

14

x

numbers   *variables*

$11y^2$

"Terms are numbers, variables,
or the
product of numbers and variables

Jay Leno's monologue

Example   Example   Example

Binomials...

Red = First term
Green = Second term

Binomials are polynomials with TWO terms.

$7x+3$

$12y-x$

$13x^2+x$

Terms are separated by "+" and "-" signs!

Example

Example

Example

Trinomials...

Red = first term
Green = Second term
Blue = Third term

Trinomials are polynomials with THREE terms.

Mirrors not included

$-6x + 7y - 2$

$7x^2 + 8x + 7$

$8 + 5m - 7m^2$

Example

Example

Example

Monomial	Binomial	Trinomial
6x	10x-5w	$6x^2$-5x+8
71	8b+2	7y+9z-q
O Signs	**1sign**	**2 signs**

Sort the following polynomials into the above categories:

The coefficient of the variable... $15x$ ... is 15.

The coefficient is the number in front of the variable.

→ $13x^2 = 13$
→ Variable

$999w = 999$
↑
Coefficient

Degree of a Polynomial

The term with the
greatest exponent
determines the
degree of the polynomial.

$$5x - 3x^2 + 7^0$$

This polynomial has a degree of 2.
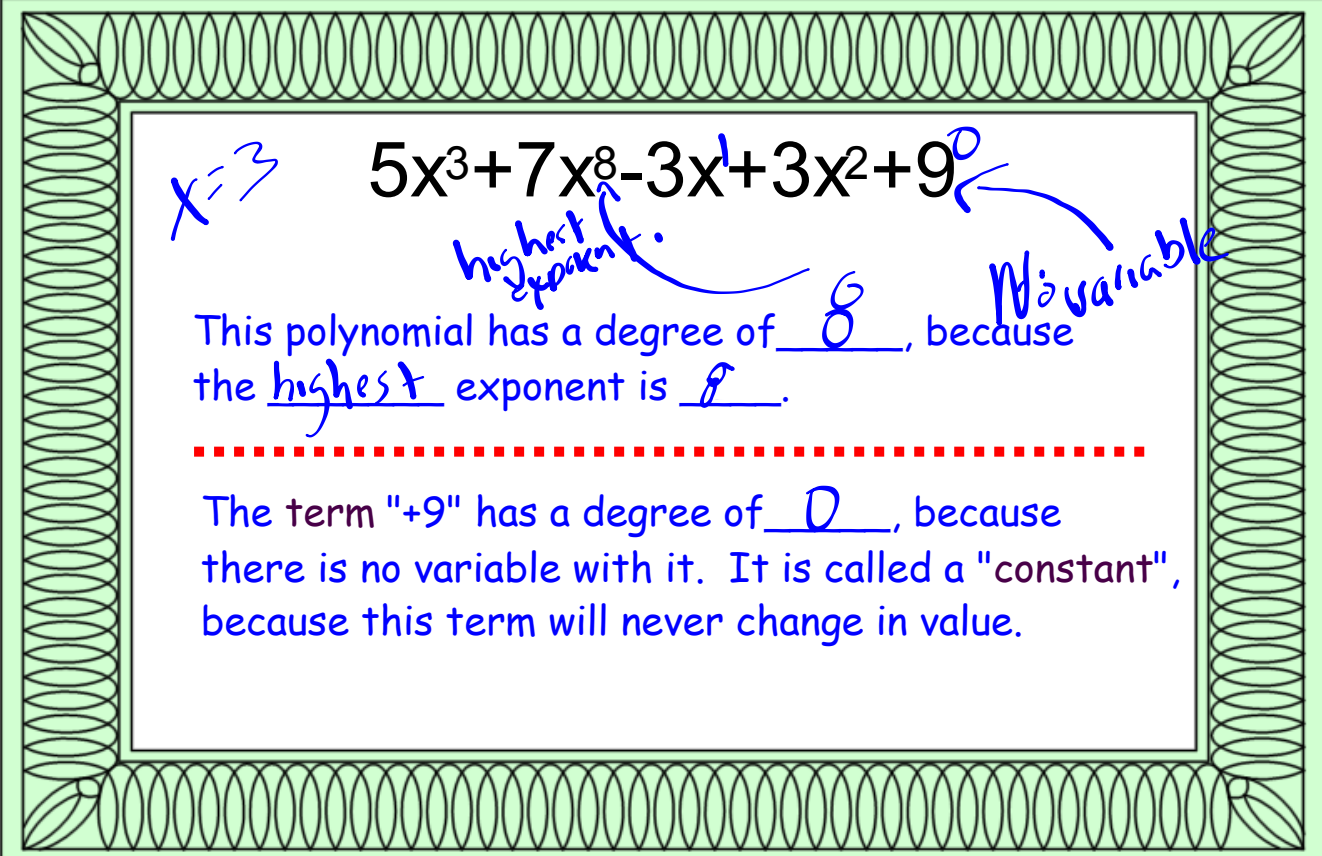
Trinomial

No Variable

2 Terms: Cofficent

Degree

$$5x^3+7x^8-3x+3x^2+9$$

This polynomial has a degree of ___8___, because the _greatest_ exponent is __8__.

· ·

The term "+9" has a degree of ___0___, because there is no variable with it. It is called a "constant", because this term will never change in value.

$$5x^3+7x^8-3x^1+3x^2+9$$

$x=3$

highest exponent.

No variable

This polynomial has a degree of ___8___, because the _highest_ exponent is __8__.

The term "+9" has a degree of ___0___, because there is no variable with it. It is called a "constant", because this term will never change in value.

Polynomials are written in <u>descending</u> order.

Each term is written
    from the highest <u>degree</u>
        to the lowest.

highest

lowest.

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

will be written as...

$$-3x^4 + 5x^3 + 4x^2 - x^1 + 7^0$$

highest → lowest

Algebraic expressions that;
1) have terms with a variable in
the denominator,

$\dfrac{13}{z}$

$\rightarrow 13z^{-1} \leftarrow$ negative.

Term

the square
root of a variable

$\sqrt{g}$

$g^{1/2} \leftarrow$

Not whole
number.

$\downarrow$

$0.5.$

or have a negative exponent

z^{-2}

$\dfrac{1}{z}^{1/2} \leftarrow$

Are NOT polynomials!

Modelling Polynomials

$3x+4$

$2x^2-4x+2$

$-x^2$ $-x$

x^2 x 1

$x \cdot x$
$= x^2$

x^2+2
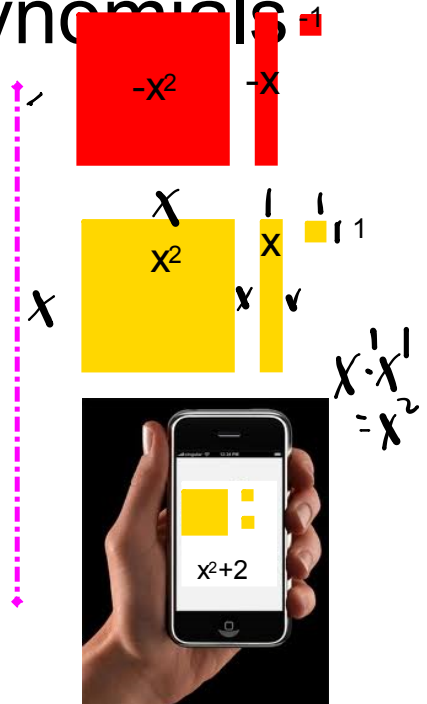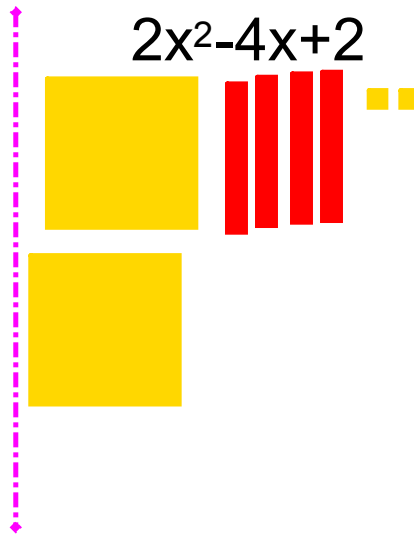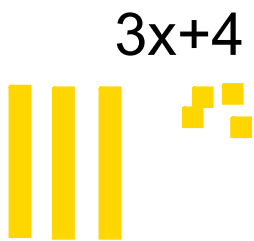
Modelling Polynomials
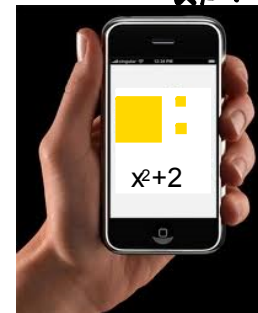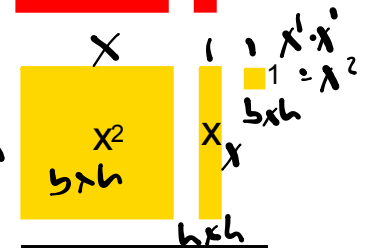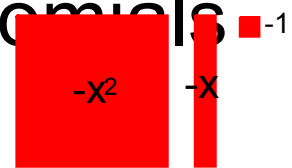
Write the algebraic expression that
represents each model.

Don't forget to write it properly!

$-x^2$ $-x$ -1

$-x^2 + 6x - 2$

$$\frac{2x^2 - 3x + 6}{2x^2 + 6 - 3x}$$

x 1 $x^1 \cdot x^1$

x x^2 x $1 = x^2$

$b \times h$ $b \times h$

$b \times h$

$x^2 + 2$

Not descend.;

Check out pages 214 - 216

4-10

4. Which choices represent polynomials? Remember the three types of terms which affect polynomials...

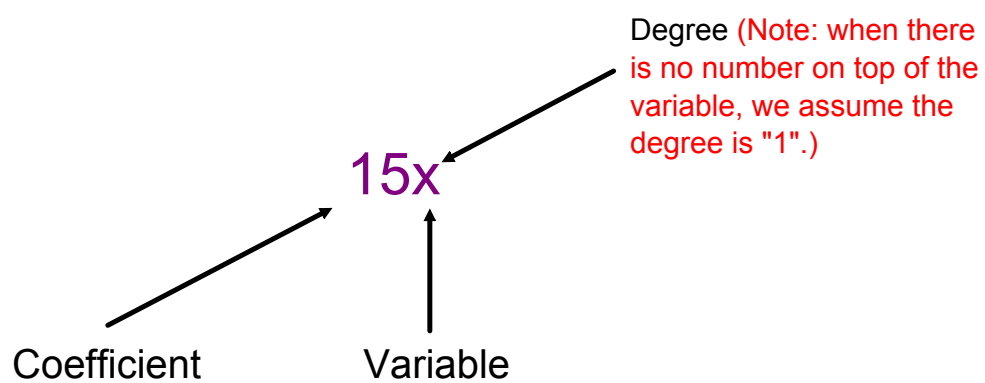$$\frac{13}{z} \qquad \sqrt{g} \qquad z^{-2}$$
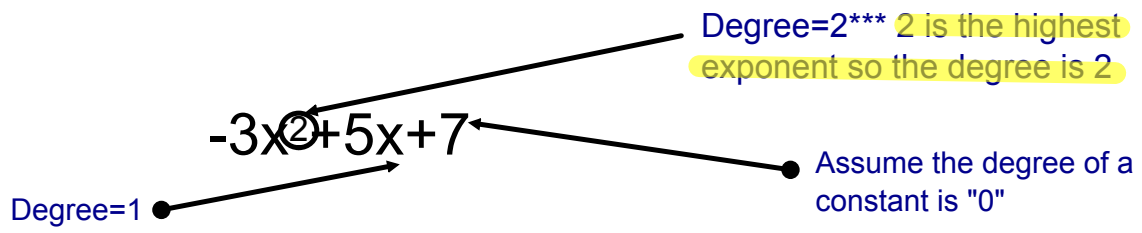
5.

monomial

binomial

trinomial

# of terms

6.

Degree (Note: when there is no number on top of the variable, we assume the degree is "1".)

15x

Coefficient   Variable

7.

Degree=2*** <mark>2 is the highest exponent so the degree is 2</mark>

$$-3x^2+5x+7$$

Degree=1

Assume the degree of a constant is "0"

Remember: The degree of a polynomial refers to the term which has the highest exponent in it.

exponent

base 5^2

power

5^3

5 x 5 x 5

25 x 5

125
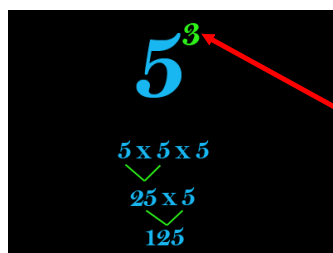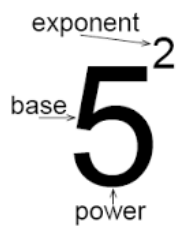
Exponent

8. Hint: 1) Rearrange all the polynomials into descending form (See slide 11)

2) Remember that different variables (ie "r" and "v" represent the same thing)

9.

11.   see slides 13 and 14