

UNIT 1: POLYNOMIALS

Monomial: an algebraic expression that has one term

Ex: $3x^2$

Coefficient: 3

Base: x

Exponent: 2

Rules for Adding and Subtracting Monomials

Ex. $2x^4 + 3x^4 = 5x^4$

Combine like terms

Add/subtract coefficients

Keep the base

Leave exponents alone!

Rules for Multiplying Monomials

Ex: $m \cdot m^8 = m^9$

Multiply coefficients

Multiply like variables (keep the base, add exponents)

Power Rule:

Ex: $(2x^2)^3 = 8x^6$

Raise coefficients to the outside power

Keep the base, multiply the exponents

Rules for Dividing Monomials:

Ex: $24b^5c^8 \div -3b^3c^8 = 8b^2$

Divide coefficients

Divide the “like” variables

Keep the base, subtract the exponents

Rules for Dividing Negative Exponents:

Ex: $y^2 \div y^6 = y^{-4} = \frac{1}{y^4}$

Write its reciprocal

Make exponent positive

Subtracting Polynomials:

$$(5x^2 + 3x - 6) - (3x^2 - x + 5)$$

This guy distributes into these!

$$= 5x^2 + 3x - 6 - 3x^2 + x - 5$$
$$= 2x^2 + 4x - 11$$

Multiplying Polynomials (Tabular Method)

$$\begin{array}{r} 2x \quad +5 \\ \hline \begin{array}{|c|c|} \hline 6x^2 & 15x \\ \hline -8x & -20 \\ \hline \end{array} \begin{array}{l} 3x \\ -4 \end{array} \\ \hline 6x^2 + 7x - 20 \end{array}$$

Dividing Polynomials by a Monomial:

$$\frac{18x^4 - 10x^2 + 6x^7}{2x^2} = \frac{18x^4}{2x^2} - \frac{10x^2}{2x^2} + \frac{6x^7}{2x^2}$$

Now, we just reduce each term!

$$= 9x^2 - 5 + 3x^5$$

Rewrite final answer in standard form: $= 3x^5 + 9x^2 - 5$

OR Double Distribute

$$(x - 7)(2x - 3)$$
$$2x^2 - 3x - 14x + 21$$

Combine Like Terms:

$$2x^2 - 17x + 21$$

Multiplying Conjugates: You can use a shortcut! Multiply the 1st and last terms only!

$$(a - b)(a + b) = a^2 - b^2$$

Ex: $(x + 4)(x - 4) = x^2 - 16$

Formulas:

AREA of a square: s^2

AREA of a rectangle: $L \cdot W$

PERIMETER of any shape: "S.O.S." (Sum of all sides)

THE NUMBER SYSTEM

Natural Numbers: Does not include zero (0)

Ex. 1, 2, 3...

Whole Numbers: Natural numbers that include zero (0)

Ex. 0, 1, 2, 3...

Integers: Whole numbers and negative numbers combined

Ex. -2, -1, 0, 1, 2

Rational Numbers: Repeating or terminating decimals or fractions

Ex. $1\frac{1}{2}$, 1, .23232323232..., .2, $\sqrt{25}$, -8

Irrational Numbers: Non-terminating, non-repeating decimals; cannot be written as a fraction

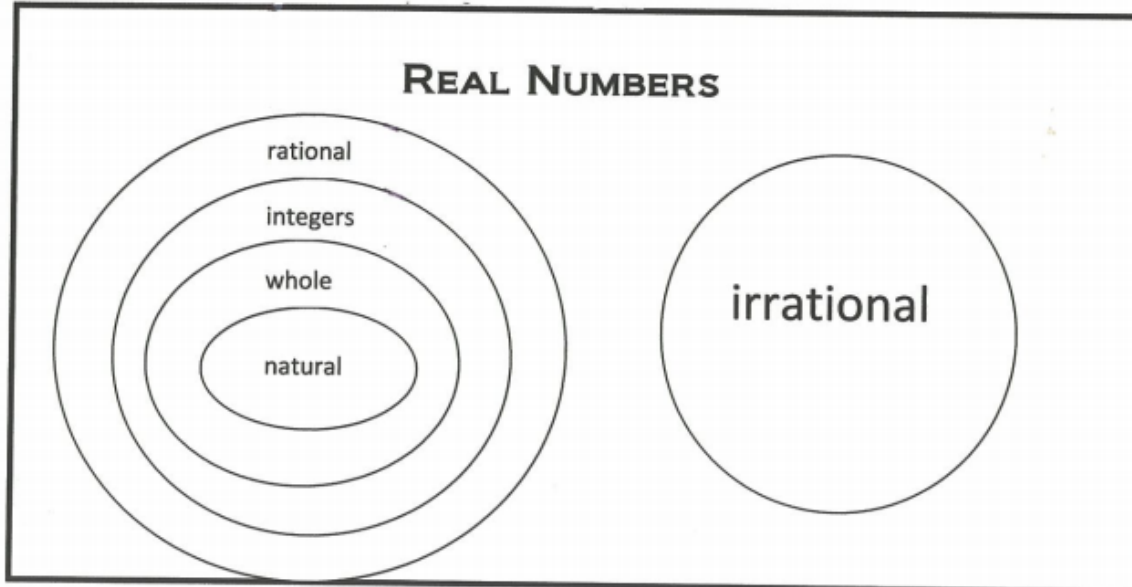
Ex. .12345..., π , $\sqrt{15}$, .131131113...

Real Numbers: All rational and irrational numbers together

.12345..., π , $\sqrt{15}$, .131131113..., $1\frac{1}{2}$, 1, .23232323232..., .2, $\sqrt{25}$, -8


Absolute zero: the number's distance from zero

Ex. $|-2| = 2$, $|2| = 2$




PROPERTIES

1) Commutative Property of Addition/Multiplication

 $a+b=b+a$ $5+4=4+5$
 $(a)(b)=(b)(a)$ $5\times 3=3\times 5$
“Change Order”

2) Associative Property of Addition/Multiplication

 $(a+b)+c=a+(b+c)$ $(1+2)+3=1+(2+3)$
 $a\times(b\times c)=(a\times b)\times c$ $1\times(2\times 3)=(1\times 2)\times 3$
SS: two sets of ()'s

3) Distributive Property

$a(b+c)=ab+ac$ $4(3+2)=4(3)+4(2)$
 $a(b-c)=ab-ac$ $4(3-2)=12-8$

4) Additive Identity Property

$0+a=a$ $2+0=2$
 $-a+a=0$ *Keeps its identity

For extra help and definitions with this unit scan the following:



For extra help with multiplying polynomials, scan below:



For extra help in dividing polynomials, scan below:



Scan below to play the exponent game:



For more practice with properties, scan below:

