

## Concepts on Test #4

Simplifying algebraic expressions

**EX. Simplify**  $7(x + 3) + 4x^2 + 5x - 12 - 2(x^2 + 3x)$

Adding/subtracting polynomials

**EX. Subtract**  $(3x - 5x^2 + 9) - (4 - 17x^2 + 4x)$

Multiplying polynomials

Product Rule for Exponents:  $a^r \cdot a^s = a^{r+s}$

Mono x Mono:

**EX. Simplify**  $(5x^2y^3)(2x^3y^8)$

Mono x Polynomial:

**EX. Simplify**  $2x^2(3x^3 + 2x - 5)$

Binomial x Binomial:

**EX. Simplify/Multiply**  $(2x + 5)(3x - 9)$

Special Case: Conjugates Multiplied

**EX. Multiply**  $(2x + 4)(2x - 4)$

Associative Prop used

Mono x Binomial x Binomial:

**EX. Multiply**  $2x(3x + 5)(3x + 4)$

Binomial x Polynomial:

**EX. Multiply/Simplify**  $(2x + 1)(3x^2 + 2x + 5)$

Solving Algebraic Equations

Simplifying 1<sup>st</sup>

Combine like terms only:

**EX. Solve a)**  $2x = 3x - 10 + 4x$     **b)**  $5x - 7 + 12 = 10$

Distributive prop & combining:

**EX. Solve a)**  $2(x + 3) + 5 = 9$     **b)**  $3(x + 4) - 2x = -44$

Using the addition prop more than once:

**EX. Solve**  $2x + 5 = 9x - 2$

Using the multiplication prop after addition prop & simplification:

**EX. Solve**  $2x + 9 = 5x + 7 - 84$

Checking as substitution:

Check your answer to

**EX. Solve a)**  $2x = 3x - 10 + 4x$     **b)**  $3(x + 4) - 2x = -44$

Prime Numbers vs Composite

Prime factorization

Using exponential notation

**EX. Find prime factorization for 108 & 96 writing as a product of primes**

ALL factors of a number:

**EX. List all the factors of 108 & 96**

## Greatest Common Factor

For # via ALL factors:

**EX.** Find the GCF of 108 & 96

For variables-- lowest exponent:

**EX.** Find the GCF of  $x^2y^3z$ ,  $x^3y^2z^2$  &  $x^5y^3$

Monomial / Monomial:

Quotient Rule:  $a^r \div a^s = a^{r-s}$

**EX. Divide**  $15x^3y^7 \div 45x^2y^3$

## Factoring a Polynomial w/ GCF:

Find GCF

Rewrite as GCF(sum of quotients of original by GCF)

**EX.** Factor  $12x^3 + 3x^2 + 9x$

## Fractions

Visual interpretation of fractions:

Proper Fractions

Improper Fractions

Mixed #'s:

**EX.** Draw a picture to represent a)  $\frac{2}{3}$  b)  $1\frac{3}{4}$  c)  $\frac{9}{5}$

## Reducing Fractions:

With Prime factors

Cancel

GCF Method

Rewrite as product & cancel **OR** divide out GCF

**EX.** Reduce/Put in lowest terms a)  $\frac{24}{36}$  b)  $2\frac{15}{18}$

## Finding LCD w/ primes

**EX.** Find the LCD of a) 28 & 36 b) 8 & 10

## Mixed Numbers $\Leftrightarrow$ Improper Fractions

**EX.** Change  $2\frac{3}{5}$  to an improper fraction

**EX.** Change  $\frac{17}{5}$  to a mixed number

## Adding Fractions w/ Common Denominators

Add numerators & carry along denominator

**EX.** Add  $\frac{7}{48} + \frac{12}{48}$

Reducing if needed (see above)

**EX.** Add  $\frac{36}{48} + \frac{2}{48}$