

Chapter 1: Review

QUIZ AND TEST INFORMATION: The material in this chapter is on **Quiz 1** and **Exam 1**. You should complete at least one attempt of Quiz 1 before taking Exam 1. This material is also on the final exam.

TEXT INFORMATION: The material in this chapter corresponds to the review sections of your text book. Please read these sections and complete the assigned homework from the text that is given on the last page of the course syllabus. There is a lot of review material and it will only be gone over briefly in class.

LAB INFORMATION: There is no lab which specifically corresponds to the review material, but you will need this material to complete other labs.

Section 1: Number Systems and Sets of Numbers

- Definition: A set is _____
_____.

- Definition: Roster Form Description of a Set: list out the elements of a set between curly brackets

Example:

- Note: If you want to denote an infinite set, write down elements until the pattern becomes clear then put an ellipse (...).

Example:

- Definition: Set builder notation: $\{x | x \text{ satisfies certain conditions}\}$

Example:

- Definition: Natural numbers = _____
- Definition: Whole numbers = _____
- Definition: Integers = _____
- Definition: Rational Numbers = _____
- Definition: Irrational Numbers = _____

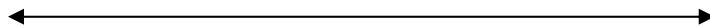
- Definition: Real numbers = the set of rational and irrational numbers
- Order of Operations:
 1. Parentheses
 2. Exponents
 3. Multiplication and Division
 4. Addition and Subtraction

Example:

- Distributive Property:
 1. $4(2x - 1) =$ _____
 2. $(x + 5)(x + 1) =$ _____
- Domain: Determine the domain of $\frac{3}{x(x-4)}$.

- Interval notation:
 1. $[0,1]=$ _____

On a number line this looks like:



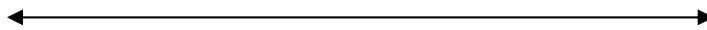
2. $(0,1) =$ _____

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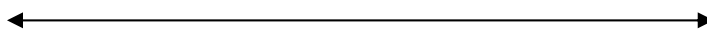
3. $[0,1) =$ _____

On a number line this looks like:



4. $(0,1] =$ _____

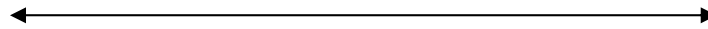
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• Interval notation with infinity (∞):

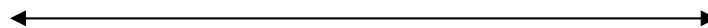
1. $(2, \infty) =$ _____

On a number line this looks like:



2. $[2, \infty) =$ _____

On a number line this looks like:



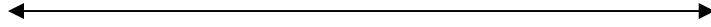
3. $(-\infty, 2) =$ _____

On a number line this looks like:



4. $(-\infty, 2] =$ _____

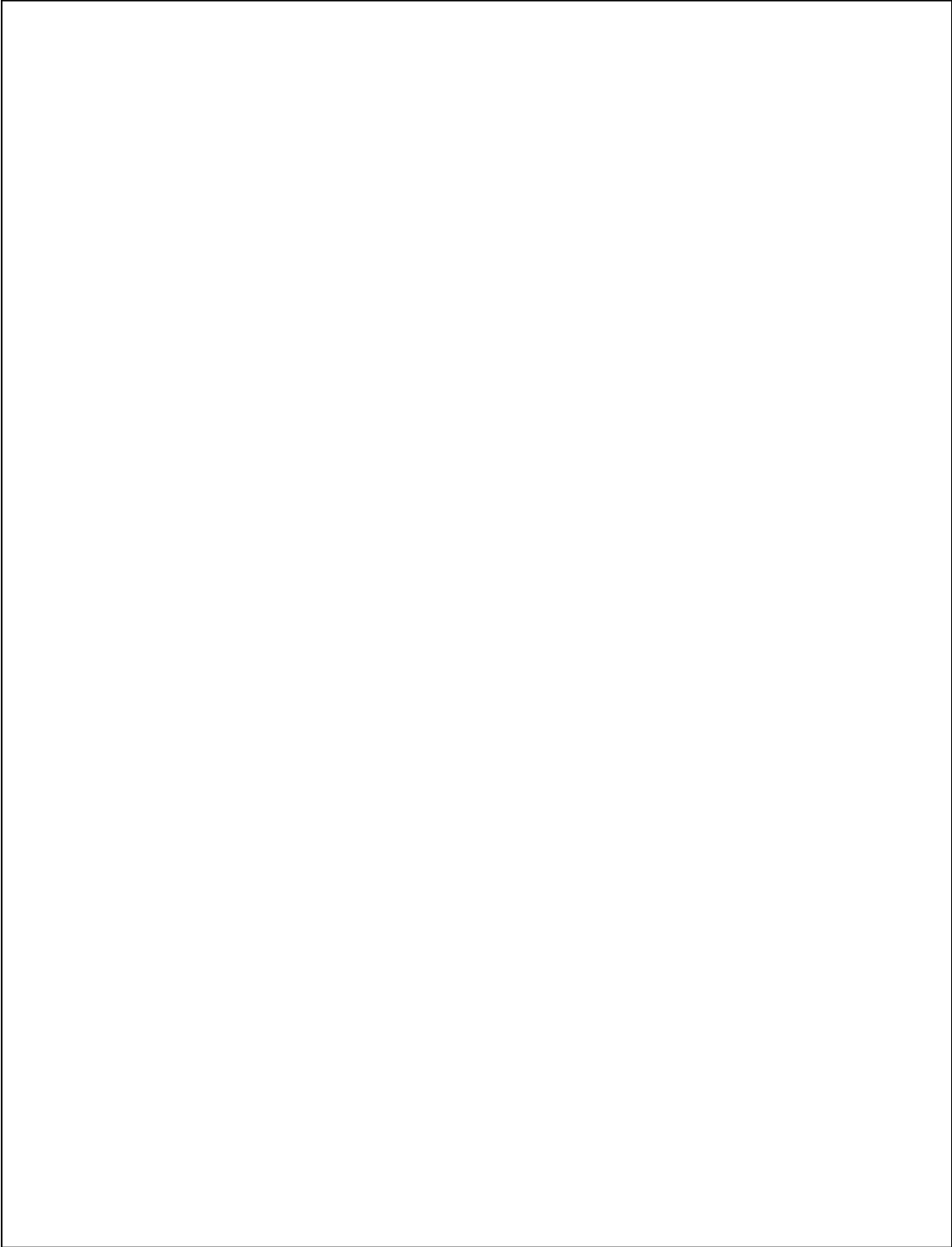
On a number line this looks like:



- Definition: The union of two sets, A and B, is the set consisting of _____.
- Definition: The intersection of two sets, A and B, is the set consisting of _____.
- Other examples and notes:

Section 2: Integer Exponents

- Laws of exponents:



- Example 1: Simplify the expressions using the laws of exponents.

1. 2^2 _____

2. $(-2)^2$ _____

3. -2^2 _____

4. 2^{-2} _____

5. $(-2)^{-2}$ _____

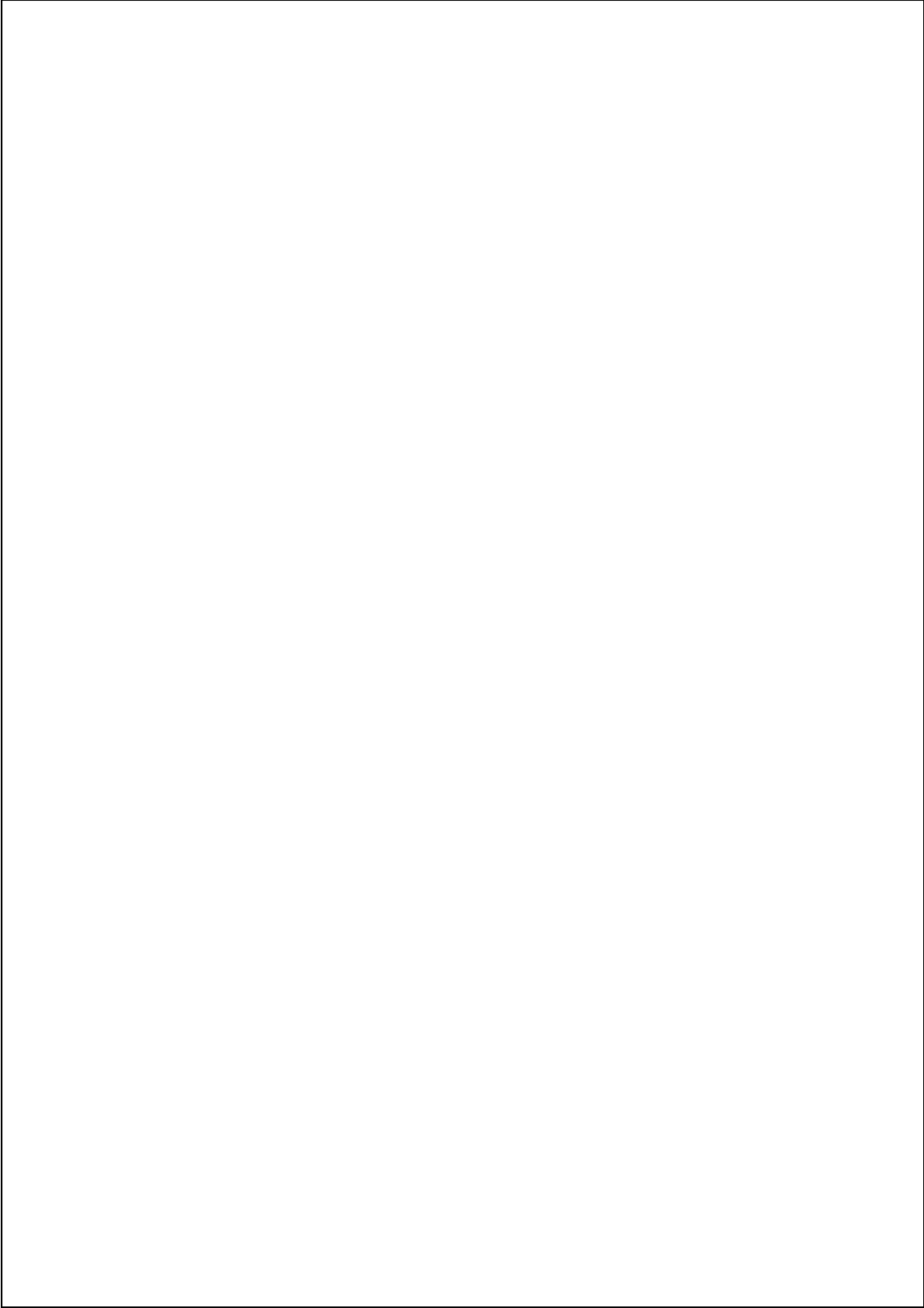
6. -2^{-2} _____

- Example 2: Simplify the expression. Write your answer using positive exponents only.

$$\left(\frac{y}{x}\right)^{-2}$$
$$= \frac{\quad}{x^{-2}y}$$

- Pythagorean Theorem:

- Other examples and notes:

A large, empty rectangular box with a thin black border, intended for the user to provide examples and notes related to the chapter review.

Section 3: Polynomial Expressions

- Definition: A monomial is an expression of the form _____, where

_____.

Example: _____

- Definition: A polynomial is an expression of the form _____,
where _____.

Example: _____

- Definition: The degree of the polynomial is _____

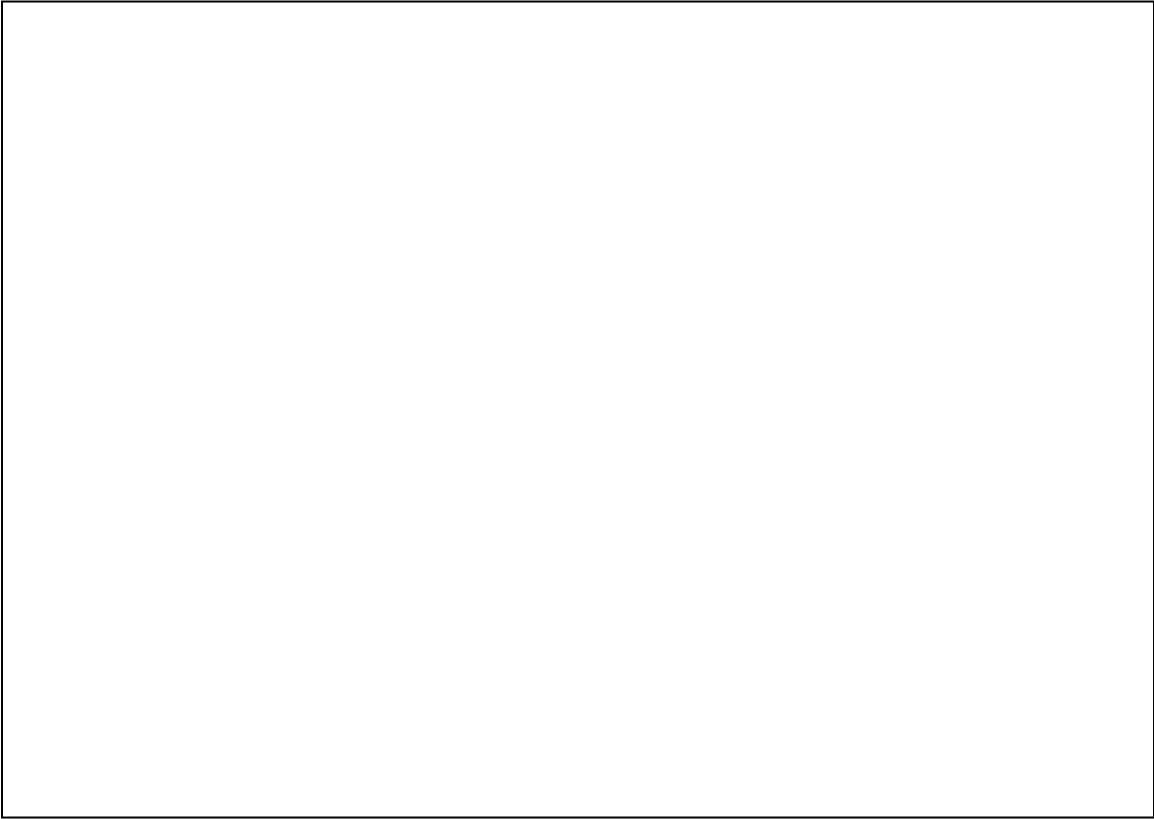
_____.

Example: The degree of the above example of a polynomial is _____.

- Example 1: Some examples of expressions that are not polynomials are:

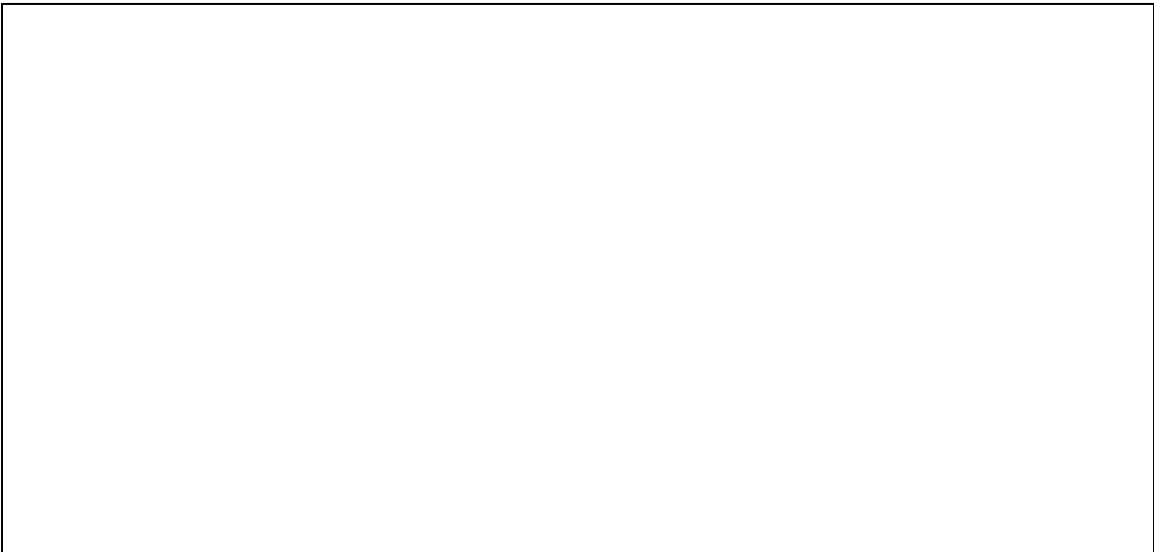
- Example 2: We can add, subtract, and multiply polynomials.

Examples:



- Example 3: We can also divide a polynomial by a second nonzero polynomial.

Example:



- Note: When we divide polynomials, we have that the
Dividend = (divisor)(q_____) + r_____

- Example 4: We also factor polynomials.

Example: Factor $p(x) = x^2 - 3x - 18$.

Example: Factor $q(x) = x^3 - x$.

- Other examples and notes:

Section 5: Rational Expressions

- Definition: A rational expression is an expression of the form _____, where _____.
- Definition: A rational expression is in simplest form when _____.
- Example 1: Simplify the rational expression: $\frac{x^2 + x}{x^2 + 4x + 3}$.

- Example 2: Simplify the rational expression: $\frac{x^2 - x - 2}{x^2 - 4x + 4}$.

- Example 3: Add the rational expressions: $\frac{1}{x-3} + \frac{1}{3-x}$

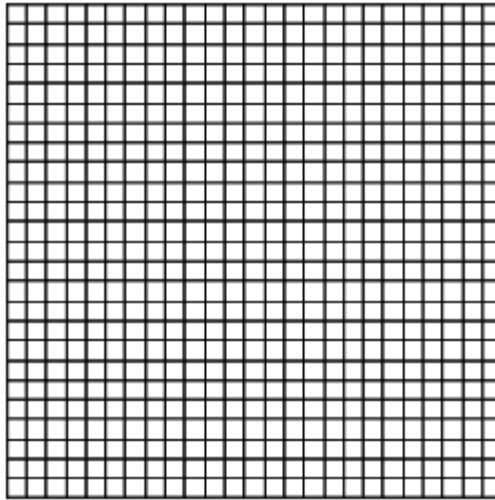
- Example 4: Multiply the rational expressions: $\frac{x^2 + 4x + 4}{x^3 - x} \cdot \frac{4x^2 - 4}{x^2 + 3x + 2}$.

- Other examples and notes:

Section 3: Radicals and Rational Exponents

- Notation for Rational Exponents:

- Example 1: Sketch the graph of $y = x^{1/2} = \sqrt{x}$.



- Properties of Radicals and Rational Exponents:

- Example 2: Simplify $\sqrt{(-4)^2}$.

- Example 3: Simplify $(24)^{1/2}$.

- Example 4: Simplify $\sqrt{12x^2}$.

- Example 5: Simplify $\sqrt{2x}\sqrt{4x}$.

- Example 6: Simplify $\sqrt{\frac{16}{25}}$.

- Example 7: Simplify $6\sqrt{5} + \sqrt{5} - 4\sqrt{5}$.

- Example 8: Simplify $\sqrt[5]{x^{10}y^5}$.

- Example 9: Simplify $(x^4y^8)^{5/4}$.

- Rationalize the denominator: The goal is to multiply the expression by an appropriate expression so that the denominator does not contain any _____.
- Example 10: Rationalize the denominator: $\frac{5}{\sqrt{10}}$.

- Example 11: Rationalize the denominator: $\frac{2}{\sqrt{7}-2}$.

- Other examples and notes: