Algebra Concepts

Fraction Operations

- You need a **common denominator** to add or subtract fractions.
- Use **keep-change-flip** to divide fractions.

Factors versus Terms

- **Terms** are expressions being added or subtracted.
- **Factors** are multiplied or divided.
- **Collect like terms** by adding their **coefficients**.

Distribution

- Distribute to expand **factors** into **terms**.

$$a(b+c) = ab + ac$$

- Use **FOIL** (first, outside, inside, last) to expand

$$(a+b)(c+d).$$

Factoring

- Know how to factor out **common factors**.
- Know how to factor **quadratic polynomials**:

$$ax^2 + bx + c.$$

Cancellation Rules

- You can cancel **common factors** in fractions, but you can't cancel terms!

Order of Operations

- Use a mnemonic like **PEMDAS** if it helps.

Solving Simple (Non-Polynomial) Equations

- You can do anything you want, as long as you do it to both sides.

Solving Polynomial & Rational Equations

- Move every term to one side and factor to find the **roots** where the expression equals zero.
- A fraction is only zero when the top is.

Linear Functions

- **Slope** is rise over run.
- **Slope-intercept form**

$$y = mx + b.$$

- **Point-slope form**

$$y - y_1 = m(x - x_1).$$

Function Notation

- $f(x)$ looks like multiplication, but it's not!

Exponent Rules

- Powers represent repeated multiplication.

$$a^n = \underbrace{a \cdot a \cdot a \cdot \cdots \cdot a}_{n \text{ copies}}$$

- Negative powers represent reciprocals.

$$a^{-n} = \frac{1}{a^n}$$

- Fraction powers represent roots.

$$a^{1/n} = \sqrt[n]{a}$$