

General Topic: Advanced Algebra

Lesson Overview:

Advanced Algebra focuses on solving complex equations and expressions, including quadratic systems, polynomials, and rational expressions, preparing students for higher-level mathematics.

Key Concepts and Subtopics:

1. Quadratic Systems – Solving equations with two or more variables using substitution or elimination

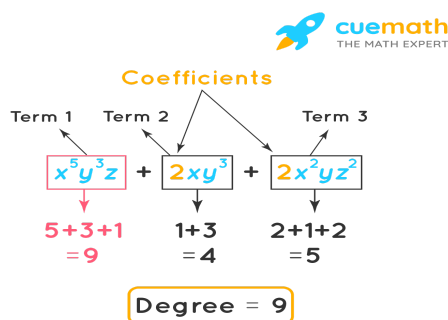
Quadratic Equation

MATH MONIES

$$ax^2 + bx + c = 0$$

here,
'a' and 'b' are the coefficients,
'x' is the variable, & 'c' is a constant

2. Polynomials – Operations (addition, subtraction, multiplication, division) and factoring



3. Rational Expressions – Simplifying, multiplying/dividing, and solving equations involving fractions with polynomials

The diagram shows a rational expression: $\frac{x^2 + 5}{x + 2}$. The numerator is $x^2 + 5$ and the denominator is $x + 2$. Arrows point from the labels "numerator" and "denominator" to their respective parts. Below the expression, it says "A Rational Expression because it is a 'ratio' of two polynomials".

Reference: <https://quizizz.com/admin/quiz/6542b2c72ff25a48e1e530a6/adding-and-subtracting-rational-expressions>

Real-Life Example:

A business uses polynomial functions to model profit and expenses, helping predict future financial outcomes.

Remember This!

- *Algebra is not just about numbers—it's a tool for modeling and solving real-world problems.*

General Topic: Trigonometry

Lesson Overview:

Trigonometry deals with the **relationships between angles and sides of triangles**, and its applications in measuring heights, distances, and waves.

Key Concepts and Subtopics:

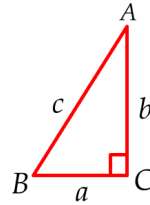
1. Trigonometric Ratios – Sine, cosine, and tangent functions

For any right triangle ABC, with C as the right angle and c as the hypotenuse,

$$\sin A = \frac{\text{opposite side}}{\text{hypotenuse}} = \frac{a}{c}$$

$$\cos A = \frac{\text{adjacent side}}{\text{hypotenuse}} = \frac{b}{c}$$

$$\tan A = \frac{\text{opposite side}}{\text{adjacent side}} = \frac{a}{b}$$



2. Solving Right Triangles – Using trigonometric ratios to find missing sides or angles

3. Applications of Trigonometry – Navigation, architecture, and engineering

Real-Life Example:

An engineer uses trigonometry to calculate the slope of a roof to ensure proper water drainage.

Remember This!

- *Trigonometry connects geometry and algebra to measure and analyze the physical world.*

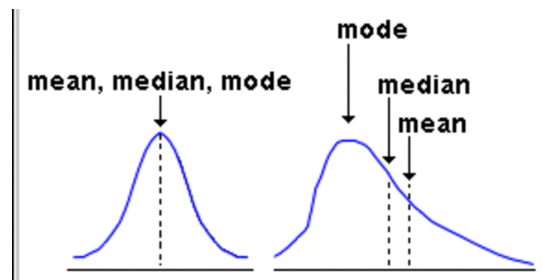
General Topic: Statistics and Probability

Lesson Overview:

Statistics and probability involve **collecting, analyzing, and interpreting data**, as well as predicting outcomes in uncertain situations.

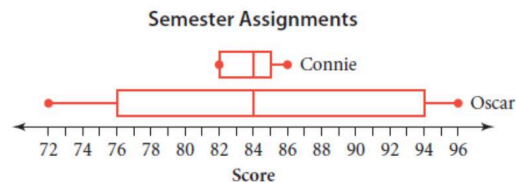
Key Concepts and Subtopics:

1. Measures of Central Tendency – Mean, median, and mode



Reference: <http://hubpages.com/education/Central-Tendency>

2. Measures of Spread – Range, variance, and standard deviation



Reference: <https://www.slideserve.com/lada/measure-of-spread-powerpoint-ppt-presentation>

3. Probability – Likelihood of events occurring, independent and dependent events

Real-Life Example:

Weather forecasts use probability to estimate the chances of rain based on historical and current data.

Remember This!

- *Statistics help us understand data, while probability helps us predict the future.*