



2024-2025

Rapid City
Stevens High School

Transition to College Mathematics

RCAS Policies/Procedures:

Students will be required to follow all RCAS policies and procedures. To view the RCAS High School Student Handbook, click [handbook](#).

Course Description:

This course will aid in the retention of math skills for later college or career level work. Topics covered in this course are designed to strengthen and review algebraic reasoning. Students will study problem solving strategies, set theory, real number systems, and linear and quadratic functions.

Textbook: The Consortium for Foundation Mathematics. Applied Mathematics. Pearson Custom Publishing, 2010.

Required Resources:

NA

“Limited Choice” Resources: (students will be asked to choose at least one title from this list)

NA

Student Choice:

Will student be asked to choose additional reading material from the classroom or school library?

No

Essential Questions:

1. How do you use problem solving and mathematical models to solve real-world problems?
2. How to use linear functions and problem solving to solve problems?
3. How do you solve systems of linear equations?
4. How do you solve quadratic functions using every day situations?
5. How do you solve direct and inverse variation problems involving every day rate problems?
6. How can you use math to model exponential real-world problems?
7. How can you use math to model logarithmic real-world problems?
8. How can you solve a real-world math problem involving exponential situations?
9. How can you solve a real-world math problem involving logarithmic situations?

Essential Learning Intentions:

Students will learn to:

- communicate and organize mathematical concepts
- develop organizational skills of mathematical concepts
- use basic steps for problem solving
- use proportional reasoning as a problem-solving strategy
- apply rates directly to solve problems
- identify input and output in situations involving two variables
- write the equation to define a function
- solve an equation numerically, graphically, and algebraically
- develop a mathematical model in the form of an equation
- develop mathematical models to solve problems
- use problem solving skills to make decisions based on solutions of mathematical models
- describe in words what a graph tells you about a given situation
- obtain a new graph from an original graph using transformations
- determine average rate of change
- identify linear functions by a constant rate of change
- identify whether a situation can be modeled by a linear function
- identify the effect of changes in the equation of a line on its graph
- write an equation for a linear function given its slope and y-intercept
- determine the equation for a linear function that includes two given points
- construct scatter points from sets of data pairs
- understand the need to first make a scatterplot of the data before calculating a correlation coefficient and regression line

- determine the equation of a regression line using graphing utilities
- collect and organize data in a table
- graph a piecewise linear function
- solve a system of two linear equations numerically, graphically, and algebraically
- determine the break-even point of a linear system algebraically and graphically
- solve a 2x2 linear system algebraically using the substitution and elimination methods
- solve linear inequalities in one variable numerically, graphically, and algebraically
- solve compound inequalities in one variable
- introduction to set theory using interval notation to represent a set of real numbers
- graph linear inequalities in two variables
- solve a system of linear inequalities graphically
- determine corner points in linear programming situation
- determine objective function in linear programming
- determine constraints for linear programming
- solve quadratic functions by factoring, graphing, quadratic formula, and completing the square
- identify key features of quadratic/parabola including vertex, minimum, maximum, increasing/decreasing intervals, positive/negative, x & y intercepts
- determine quadratic from data using a regression technology
- determine the constant of proportionality in a direct/indirect variation problem
- identify the properties of graphs of power functions defined by $y=kx^n$
- determine the domain and range for direct and indirect variation problems
- determine growth/decay factors from percent increase/decrease
- recognize exponential functions from equations, data, and graph
- distinguish between simple and compound interest
- solve problems involving continuous growth and decay models
- define logarithm
- determine the inverse of an exponential function
- apply the log product/quotient/power/base properties