*Unit 5-Functions

Content Area: **Mathematics**
Course(s):
Time Period: **Marking Period 3**
Length: **16 Blocks**
Status: **Published**

Enduring Understandings

Solving equations and evaluating equations is the bases for future mathematics.

Solutions to systems of equations are essential for providing businesses with a mathematical form of decision making.

Essential Questions

How can solving an equation be beneficial?

What does the solution to a system represent?

Content

- Simple interest and statistic formula
- Exponential growth and decay formulas
- Direct variation
- Joint variation
- Combined variation
- Quadratic Equations
- Factoring
- The quadratic formula
- Systems of linear equations
- Systems of quadratic equations
- Matrices
- Systems of matrices

Skills

- Evaluate a formula given specific values.
- Solve a formula for a given variable.
- Solve exponential growth and decay formulas for given value.

- Solve for a variable in a function or equation.
- Use direct variation to solve an equation.
- Determine the constant of proportionality.
- Solve equations involving joint and combined variation.
- Solve quadratic equations by using factoring or the quadratic formula.
- Graph a quadratic formula and determine the axis of symmetry, domain, range, and vertex.
- Graph exponential functions of growth and decay.
- Solve a system of linear and quadratic equations using substitution or elimination.
- Add, subtract, and multiply matrices.
- Solve a system of equations using matrices.

Resources

Text: *A Survey of Mathematics with Applications 2005*

Each skill is aligned to the text as a reference.

Evaluate a formula given specific values. (6.3)
Solve a formula for a given variable (6.3)
Solve exponential growth and decay formulas for given value. (6.3)
Solve for a variable in a function or equation. (6.3)
Use direct variation to solve an equation. (6.5)
Determine the constant of proportionality. (6.5)
Solve equations involving joint and combined variation. (6.5)
Solve quadratic equations by using factoring or the quadratic formula. (6.9)
Graph a quadratic formula and determine the axis of symmetry, domain, range, and vertex. (6.10)
Graph exponential functions of growth and decay. (6.10)
Solve a system of linear and quadratic equations using substitution or elimination. (7.1 and 7.2)
Add, subtract, and multiply matrices (7.3)
Solve a system of equations using matrices. (7.4)

http://www.purplemath.com/modules/systlin1.htm

https://www.khanacademy.org/math/algebra/systems-of-linear-equations

http://illuminations.nctm.org/Lesson.aspx?id=2783

https://docs.google.com/document/d/1KxXLNkgyAwG8otmLwNtX9O4Q_JS1g-tFNOAaxP4phxw/edit

Standards

Seeing Structure in Expressions

B. Write expressions in equivalent forms to solve problems

3. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

a. Factor a quadratic expression to reveal the zeros of the function it defines.

b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.

c. Use the properties of exponents to transform expressions for exponential functions.

Interpreting Functions

A. Understand the concept of a function and use function notation

1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$.

2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

C. Analyze functions using different representations

7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★

a. Graph linear and quadratic functions and show intercepts, maxima, and minima.

c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.

MA.F-IF.A.1	Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$.
MA.F-IF.A.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
MA.A-SSE.B.3a	Factor a quadratic expression to reveal the zeros of the function it defines.
MA.A-SSE.B.3b	Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.
MA.A-SSE.B.3c	Use the properties of exponents to transform expressions for exponential functions.

MA.F-IF.C.7a	Graph linear and quadratic functions and show intercepts, maxima, and minima.
MA.F-IF.C.7c	Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.