Pure Math 20
Unit Plans

Resource: 'Mathpower 11'

Mathematics 20 is the second of three high school pure mathematics courses. It builds on the skills developed in Pure Math 10, while examining functions and relations and their graphs. While algebraic solutions continue to be important, greater emphasis is placed on the use of a graphing calculator to examine a wide range of functions. Extensive use will be made of graphing calculators and software (computer) packages, including spreadsheets and a graphing utility. Pre-topic review and some quizzes will also take advantage of the extensive mathematics resource base on the school website.

Teaching methods will include a broad use of visual aids, as well as an expectation on the students' part to be able to explain, both orally and in written format, the concepts they have learned. This is especially important in a video-conferenced classroom, where some students' written work is not always immediately visible to the teacher.

Unit 1: Systems of Equations (1 1/2 weeks)
Unit 2: Linear Inequalities (2 weeks)
Unit 3: Quadratic Functions (2 weeks)
Unit 4: Quadratic/Polynomial Equations (4 weeks)
Unit 5: Functions (3 weeks)
Unit 6: Logical Reasoning (1/2 week)
Unit 7: The Circle (2 weeks)
Unit 8: Coordinate Geometry / Trigonometry (2 weeks)
Unit 9: Personal Finance (1 week)

Exam Review ……. 1 week

Evaluation:

Term: ……60%
Homework/Quizzes: 20%
Unit Tests: 80%
Exam: ……..40%

Homework:
Homework not handed in on the due date, or homework not completed fully, will be considered late, unless you are excusably absent.

Homework assignments missed due to *excusable* absence on the day they were assigned do **not** need to be handed in. However, several assignments missed in one unit for this reason may be replaced by a special review assignment.

If you were *excusably* absent when the homework was **collected**, the assignment is due at the beginning of the first class after your return, and will not be considered late if handed in then.

Assignments not handed in for other reasons may lose 20% of their mark per day late. Once the marked assignments are returned by the teacher, the mark for a missed assignment becomes 0%.

Extra help is available, if it's arranged a day or two in advance.

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Resource: Math Power 11 (McGraw-Hill, Ryerson)

Introduction and review

Unit 1: Systems of Equations

- Overview; solving graphically
- Practical problems
- Algebraic methods:
- Substitution
- Comparison
- Elimination

- Review and practice
- More problems
- Three variable systems
- Non-linear systems
- Unit review and test

Unit 2: Linear Inequalities

- Review (linear equalities)
- Problem solving and calculator solutions
- Linear inequalities and graphing
- Two variable solutions and graphing
- Problem solving
- Solving systems of linear inequalities
- Unit review and test

Unit 3: Quadratic Functions

- Review, including calculator use
- Transformations
- Translations
- Shape change
- Problem solving
- Completing the Square
- More graphing
- Practical problems
- Unit review and test

Unit 4a: Quadratic Equations

- Review (graphing, and calculator use)
- Review (solving directly)
- Review (factoring)
- Supplemental factoring review
- Problem solving
- The Quadratic Formula
- Complex answers (intro to complex numbers)
- The Discriminant
- 'Backwards' problems
- Unit review and test

Unit 4b: Solving Higher Order Equations

- Remainder Theorem
- Factor Theorem
- Integral and Rational Zero Theorems
- Equation solving
- Problem solving
- Graphing
- Finding roots of all kinds (inc. irrational and imaginary)
- Unit review and test

MidTerm Review and Exam

Unit 5: Functions

- Review
- Operations
- Composition of functions
- Inverse functions
- Problem solving
- Using a calculator
- Inequalities (quadratic and polynomial only)
- Absolute value (equations: simpler ones only)

(These last two topics come from Math 31 … use additional resources here if necessary)

- Rational functions, equations, and inequations
- Radical functions, equations (simpler ones only), and inequations
- Unit review and test

Unit 6: Logical Reasoning, Geometrical Proofs
(text Ch. 6 and beginning of 7)

- Deductive reasoning
- Analyzing statements
- Direct proofs (omit: indirect proofs)
- Connecting geometry and proofs (using geometry previously learned)
- Unit review and test

Unit 7: The Circle

Problem solving: reference trig methods

- Properties of the circle
- Proofs – direct proofs only, reference trig methods
- Angles in a circle
- More proofs (reference trig methods)
- Cyclic quadrilaterals
- Tangents
- Proofs (reference trig methods)
- Arc length and sector area
- Polygons
- Unit review and test

Unit 8: Coordinate Geometry and Trigonometry

- Connecting coordinate geometry to plane geometry
- Review: midpoint, distance formulas
- Distance from a point to a line
- Equation of a circle
- Lines and circles
- Trigonometry review, inc. sin and cos laws
- Practice
- Unit Review and test

Unit 9: Personal Finance

- Earnings
- Net income
- Interest and annuities
- Effective annual interest rate
- Consumer credit
- Mortgages
- Financial statements
- Unit review and test

Course review