



MB3 Intermediate Learning Objectives

- Students will be able to apply the distance formula, $\text{Distance} = \text{Rate} \times \text{Time}$, to problems
- Students will be able to find the n th term of an arithmetic sequence and find the sum of an arithmetic sequence
- Students will be able to find the n th term of a geometric sequence
- Students will be able to use the modulo equation ($x \bmod y$)
- Students will be able to use venn diagrams to solve problems that involve visualizing groups
- Students will be able to find the probability of compound events
- Students will be able to use casework to solve counting and probability problems
- Students will be able to find the probability of events using complementary counting
- Students will be able to find the probability of expected events
- Students will be able to find the probability of events that have infinite outcomes (Geometric Probability)
- Students will be able to find the probability of Independent and Dependent Events
- Students will be able to apply measurement values and effectively convert between them
- Students will be able to use proportional reasoning in order to solve measurement problems
- Students will be able to find the volume of 3-Dimensional Objects (e.g. Cone, Sphere, Cylinder, Pyramid, Rectangular Prism)
- Students will be able to use general concepts such as the circumference of a circle, area, perimeter, surface area, and volume to solve more complex problems
- Students will be able to find the diagonal of a rectangle
- Students will be able to differentiate between prime and composite numbers
- Students will be able to differentiate between the types of numbers including integers, whole numbers, rational numbers, and irrational numbers
- Students will be able to use divisibility rules to determine factorizations
- Students will be able to identify geometric sequences
- Students will be able to find the n th term and the sum of a geometric sequence and apply concepts to problems
- Students will be able to identify arithmetic sequences
- Students will be able to find the n th term and the sum of a geometric sequence and apply concepts to problems
- Students will be able to identify triangular numbers and be able to apply the concept to problems
- Students will be able to create proofs, specifically direct proofs
- Students will be able to construct two-column proofs and paragraph proofs
- Students will be able to identify recursive sequences and apply concept to problems



- Students will be able to use various types of factorize polynomials using various types of factorization: Difference and Sum of Powers, Vieta's Theorem, Binomial Theorem, Pascal's Triangle, Simon's Favorite Factoring Trick, and the Sophie Germain Identity
- Students will be able to solve Linear Inequalities, Polynomial Inequalities, and Rational Inequalities
- Students will be able to solve Systems of Linear Equations using substitution and elimination
- Students will be able to use synthetic division to perform Polynomial Long Division
- Students will be able to use the Rule of Product and the Rule of Sums to solve combinatorics problems involving a finite collection of sets
- Students will be able to use the permutation, combination, and binomial theorem formula in combinatorics problems
- Students will be able to use combinatorics principles in order to solve probability problems
- Students will be able to solve factorials
- Students will be able to use Pascal's Triangle to solve combination problems
- Students will be able to solve equations that use the modulo function
- Students will be able to find the distance between two points in a coordinate plane and apply concept to problems
- Students will be able to construct the general and standard form equations of a circle
- Students will be able to construct equations of line using the general equation, $y - y_0 = m(x - x_0)$
- Students will be able to find the slope of a line