

## Mathematics Grades 11 and 12

Expectation	<i>Module, PLT activity</i>
<b>Number and Number Relations</b>	
1. Read, write, and perform basic operations on complex numbers (N-1-H) (N-5-H)	
2. Evaluate and perform basic operations on expressions containing rational exponents (N-2-H)	
3. Describe the relationship between exponential and logarithmic equations (N-2-H)	
<b>Algebra</b>	
4. Translate and show the relationships among non-linear graphs, related tables of values, and algebraic symbolic representations (A-1-H)	
5. Factor simple quadratic expressions including general trinomials, perfect squares, difference of two squares, and polynomials with common factors (A-2-H)	
6. Analyze functions based on zeros, asymptotes, and local and global characteristics of the function (A-3-H)	
7. Explain, using technology, how the graph of a function is affected by change of degree, coefficient, and constants in polynomial, rational, radical, exponential, and logarithmic functions (A-3-H)	
8. Categorize non-linear graphs and their equations as quadratic, cubic, exponential, logarithmic, step function, rational, trigonometric, or absolute value (A-3-H) (P-5-H)	
9. Solve quadratic equations by factoring, completing the square, using the quadratic formula, and graphing (A-4-H)	
10. Model and solve problems involving quadratic, polynomial, exponential, logarithmic, step function, rational, and absolute value equations using technology (A-4-H)	
<b>Measurement</b>	
11. Calculate angle measures in degrees, minutes, and seconds (M-1-H)	
12. Explain the unit circle basis for radian measure and show its relationship to degree measure of angles (M-1-H)	
13. Identify and apply the unit circle definition to trigonometric functions and use this definition to solve real-life problems (M-4-H)	<i>Forest Ecology, Cast of Thousands</i>
14. Use the Law of Sines and the Law of Cosines to solve problems involving triangle measurements (M-4-H)	<i>Forest Ecology, Cast of Thousands</i>
<b>Geometry</b>	
15. Identify conic sections, including the degenerate conics, and describe the relationship of the plane and double-napped cone that forms each conic	

(G-1-H)	
16. Represent translations, reflections, rotations, and dilations of plane figures using sketches, coordinates, vectors, and matrices (G-3-H)	
<b>Data Analysis, Probability, and Discrete Math</b>	
17. Discuss the differences between samples and populations (D-1-H)	<i>Focus on Risk, Risk Assessment: Tools of the Trade</i> <i>Focus on Risk, Communicating Risks</i> <i>Municipal Solid Waste, The Waste Stream</i> <i>Forests of the World, Analyzing Patterns of Forest Change</i> <i>Forest Ecology, Adopt a Forest</i> <i>Forest Ecology, Casts of Thousands</i> <i>Forest Ecology, Story of Succession</i> <i>Focus on Forests, Who Owns America's Forests?</i>
18. Devise and conduct well-designed experiments/surveys involving randomization and considering the effects of sample size and bias (D-1-H)	<i>Municipal Solid Waste, The Waste Stream</i> <i>Forests of the World, Analyzing Patterns of Forest Change</i> <i>Forest Ecology, Adopt a Forest</i> <i>Forest Ecology, Casts of Thousands</i> <i>Forest Ecology, Story of Succession</i>
19. Correlate/match data sets or graphs and their representations and classify them as exponential, logarithmic, or polynomial functions (D-2-H)	<i>Focus on Risk, Communicating Risks</i> <i>Municipal Solid Waste, The Waste Stream</i> <i>Forests of the World, Analyzing Patterns of Forest Change</i> <i>Focus on Forests, Who Owns America's Forests?</i>
20. Interpret and explain, with the use of technology, the regression coefficient and the correlation coefficient for a set of data (D-2-H)	
21. Describe and interpret displays of normal and non-normal distributions (D-6-H)	
22. Explain the limitations of predictions based on organized sample sets of data (D-7-H)	<i>Focus on Risk, Risk Assessment: Tools of the Trade</i> <i>Focus on Risk, Communicating Risks</i> <i>Municipal Solid Waste, The Waste Stream</i> <i>Municipal Solid Waste, Recycling and Economics</i> <i>Forests of the World, Analyzing Patterns of Forest Change</i> <i>Forest Ecology, Adopt a Forest</i> <i>Forest Ecology, Casts of Thousands</i> <i>Forest Ecology, Story of Succession</i> <i>Focus on Forests, Who Owns America's Forests?</i>
23. Represent data and solve problems involving Euler and Hamiltonian paths (D-9-H)	
<b>Patterns, Relations, and Functions</b>	
24. Model a given set of real-life data with a non-linear function (P-1-H) (P-5-H)	<i>Focus on Risk, Risk Assessment: Tools of the Trade</i>
25. Apply the concept of a function and function notation to represent and evaluate functions (P-1-H) (P-5-H)	<i>Municipal Solid Waste, Recycling and Economics</i>
26. Represent and solve problems involving $n^{\text{th}}$ terms and sums for arithmetic and geometric series (P-2-H)	
27. Compare and contrast the properties of families of polynomial, rational, exponential, and logarithmic functions, with and without technology (P-3-H)	
28. Represent and solve problems involving the translation of functions in the coordinate plane (P-4-H)	
29. Determine the family or families of functions that can be used to represent a given set of real-life data, with and without technology (P-5-H)	<i>Focus on Risk, Risk Assessment: Tools of the Trade</i> <i>Focus on Risk, Communicating Risks</i> <i>Municipal Solid Waste, The Waste Stream</i> <i>Forests of the World, Analyzing Patterns of Forest Change</i>

	<i>Places We Live</i> , Green Space <i>Forest Ecology</i> , Adopt a Forest <i>Forest Ecology</i> , Casts of Thousands <i>Forest Ecology</i> , Story of Succession
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