

Preliminary info:

The test will be 2/3 new (2.6-4.4) and 1/3 old (P.1-2.5) material. The problems will be similar in format to the first two tests, though the material for the cumulative portion may include topics not covered on the first two exams (that is because the first two exams were, as are all tests, mere *samples* of the material you were supposed to know). The best way to study would be to review notes and to work homework problems from topics (see below) that you are not entirely confident with.

TOPICS

P.1

- Subsets of the real numbers (integers, rationals, etc.)
- Inequality symbols ($<$ vs. \leq and $>$ vs. \geq)
- Absolute value and distance between pts on the real line
- Evaluating algebraic expressions

P.2

- Integer exponents (positive, negative, or 0)
- Product, quotient, and power rules for exponents

P.3

- Product and quotient rules for square roots
- Adding and subtracting square roots
- Rationalizing denominators
- Higher roots and rational exponents

P.4

- The degree of a monomial/polynomial
- Adding, subtracting, and multiplying polynomials

P.5

- Greatest common factor
- Factoring by grouping
- Factoring trinomials (undo FOIL)
- Difference of squares, squares of binomials

P.6

- Domain of a rational expression
- Simplifying rational expressions
- Multiplying and dividing rational expressions
- Adding and subtracting rational exp. (same denom.)
- Adding and subtr. rational exp. (diff. denom.)
- Least common denominator
- Simplifying complex rational expressions

1.1

- Be familiar with the rectangular coordinate system
- Plotting points by themselves and as part of a graph
- x - and y -intercepts

1.2

- Solving linear equations
- Linear equations involving fractions
- Equations involving rational expressions

1.3

- Solving word problems using formulas (any such formulas will be provided for you on the exam)

1.4

- Square roots of negative numbers (factor out i)

1.5

- Solving quadratics by factoring
- Solving quadratics by the square root method
- Completing the square
- Using the quadratic formula

1.6

- Polynomial equations of degree 3+
- Equations involving radicals
- Equations in quadratic form ($t = x^2$, etc.)
- Equations involving absolute value

1.7

- Graphs of inequalities on the real line
- Interval vs set-builder notation (pick one to use)
- Solving linear inequalities
- Properties of inequalities (valid operations)
- Compound inequalities and ineq. with abs. value

2.1

- Slope of a line
- Horizontal/vertical lines and their slopes
- Point-slope form of the line equation
- Slope-intercept form of the line equation
- General form of the line equation
- Parallel and perpendicular lines

2.2

- Using the distance formula
- Using the midpoint formula
- Standard form of the circle equation
- General form of the circle equation

2.3

- Domain and range of a relation/function
- Determining whether a relation is a function
- Determining whether an eqn. represents a function (of x)
- Evaluating functions
- The difference quotient
- Piecewise functions

2.4

- Identifying graphs of functions (vertical line test)
- Determining function information based on the graph
- Increasing, decreasing, and constant functions
- Relative minima and maxima
- Average rate of change of a functions
- Even and odd functions and their symmetry

2.5

- Vertical shifts
- Horizontal shifts
- Vertical and horizontal reflections
- Vertical stretching and shrinking
- Determining whether a transformation affects the output (y - vertical) or the input (x - horizontal)

2.6

- Adding, subtracting, and multiplying functions
- Domains of the above function combinations
- Dividing functions (extra domain restriction)
- Compositions of functions and their domains
- Decomposing a function

2.7

- Verifying inverse functions
- Finding inverse functions
- Horizontal line test and one-to-one functions

3.1

- Standard form of a quadratic equation
- Locating the vertex and axis of symmetry of a parabola
- Locating the vertex of a quad. eqn. in general form
- Locating the minimum or maximum of a parabola

3.2

- End behavior and the leading coefficient test
- Finding zeros of polynomial functions
- Even vs. odd multiplicity and their effects
- Number of turning points of a polynomial function

3.3

- Dividing polynomials using long division
- The Factor Theorem, and its use in solving high-degree polynomials

4.1

- Evaluating exponential functions
- Basics of the graphs of exponential functions
- Base e
- Compound interest (formulas will be provided)

4.2

- Changing between logarithmic and exponential form
- Evaluating logarithms
- Basic properties of logarithms
- Basics of the graphs of logarithmic functions
- Common (base 10) and natural (base e) logarithms

4.3

- Product, quotient, and power rules for logarithms
- Expanding vs. condensing logarithmic expressions
- Using the change of base property

4.4

- Solving exponential equations
- Solving logarithmic equations

4.5

- Modeling with Exponential and Logarithmic Functions