

Study sheet for Math 1050 Final.

The following is a list of topics covered in this course.

- [**1:** Write the equation of a line. Analyze graphs of functions. State domain and range of a function. Determine symmetry. Evaluate a function at a given value (i.e. $f(-2)$). Find the inverse of a function, $f^{-1}(x)$. Compose functions, $(f \circ g)(x)$. Describe transformations of functions. Write the equation of a circle. Sketch graphs of basic polynomial, square root, absolute value, and rational functions using transformations. From graphs identify functions.
- [**2:** Find the roots of a polynomial by factoring, synthetic division, or the quadratic equation or some combination of these. Identify the possible rational zeroes. Sketch quadratic functions (using techniques like complete the square). Analyze a function to determine information about its graph. Perform operations on complex numbers and write complex numbers in reduced radical form. Find asymptotes and intercepts of rational functions and sketch them.
- [**3:** Graph exponent and logarithmic function with simple transformations. Identify such functions by looking at graphs. Use logarithmic properties to solve equations involving logs and exponents. Solve exponential problems including the compounding of interest and exponential growth.
- [**7:** Solve a system of equations (whether or not the equations are linear). Decompose a fraction into a sum of simpler fractions. Graph a system of inequalities to determine the area that they represent. Graph constraints and find the max or min of a linear programming model.
- [**8:** Perform operations on matrices: adding, subtracting, multiplying, finding an inverse matrix, finding a determinant. Use matrices to solve systems of equations. Find the area of a triangle.
- [**9:** Be able to evaluate expressions with the “ ” symbol. Given a list of terms in a sequence, find the next term. Find an expression for n th term of an arithmetic or geometric sequence. Find the partial sum of a series. Use binomial expansion to expand larger powers of a binomial like $(2x-3y)^6$. Find the coefficient of the given term, for example of x^2y^4 .

- [**No calculator, no notes. Write all work on the exam. No work results in very little credit.**

The cover of the exam will have the following information (which you may or may not need):

Formulas:

Parent Functions			
Parabola: $y = a(x - h)^2 + k$	Square root $y = a\sqrt{x - h} + k$	Cubic polynomial $y = a(x - h)^3 + k$	Absolute value $y = a x - h + k$
Rational $y = \frac{ax+b}{cx+d}$	Exponential $y = \pm b^{(x-h)} + k$	Logarithmic $y = \pm \log_b(x - h) + k$	

[Remember $\log(a)$ means log in base 10, and $\ln(a)$ means base e .

[the sum of n terms of a geometric series:

[The sum of n terms of an arithmetic series:

$$S_n = \frac{n}{2}(a_1 + a_n)$$

$$S_n = a_1 \left(\frac{1 - r^n}{1 - r} \right)$$

[If it exists, the sum of an infinite geometric series, if $-1 < r < 1$:

$$S_n = \frac{a_1}{1 - r}$$

Memorize the rest: quadratic formula, laws of logs, nth terms of arithmetic and geometric series, applications of the determinant, etc.