# Formulas for the Final 

University of Utah

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This is a one page (front and back) sheet of some formulas and concepts you should know for the final exam. It's not meant to be exhaustive, in that you'll need to know quite a bit more in order to do well on the final exam, but these are just some formulas I wanted to stress and make sure you know.

## 1 Domain

The domain of a function $f(x)$ is the set of all allowable inputs. In this the restrictions on our domain basically break down into three rules.

- You cannot divide by zero.
- When dealing with real numbers, you cannot take an even root of a negative number. In particular, you cannot take a square root of a negative number.
- Again when dealing with real numbers you can only take a logarithm of a positive number. So, you cannot take the logarithm of a negative number, and you cannot take the logarithm of zero.


## 2 Parabolas

The graph of a quadratic:

$$
y=a x^{2}+b x+c
$$

with $a \neq 0$ will be a parabola. If you complete the square you can write this equation as:

$$
y=a(x-h)^{2}+k
$$

which is called the standard form of the quadratic.
The vertex of the parabola occurs at the point $(h, k)$.
In the form $y=a x^{2}+b x+c$ the vertex of the parabola will have an $x$-value of $-b /(2 a)$.

## 3 The Quadratic Formula

The roots of a quadratic form are the solutions to the equation:

$$
a x^{2}+b x+c=0 .
$$

These solutions are given by the quadratic formula:

$$
x=\frac{-b \pm \sqrt{b^{2}-4 a c}}{2 a}
$$

