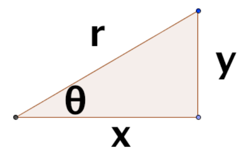
Precalc Honor Chapter 11 Study Guide Name________________

11-1

- Remember these four equations to convert between rectangular and polar coordinates:

- $x = r\cos\theta$ $y = r\sin\theta$
- $\tan\theta = \frac{y}{x}$ $r^2 = x^2 + y^2$



- Know the difference between *rectangular coordinates* (x, y), *rectangular form* a +b*i, polar coordinates (*r, θ), and *polar form* rcis θ.
- Know how to sketch polar graphs by hand, whether they be petal graphs, heart-shaped graphs, circles, lines or spirals. Review the detailed summary handout that was given out.

11-2

- Know how to graph complex numbers on a plane using the x-axis to represent the real part of the complex number and the y-axis to represent the imaginary part of the complex number. This is called an Argand Diagram.
- Know where the abbreviation rcis θ comes from, what it stands for and how to get it from a +b*i.*
- Know how to convert between polar form and rectangular form of a complex number.

11-3

- Know DeMoivre's Theorem for multiplying complex numbers by changing them into polar form, multiplying the r's and adding the θ's.
- Use DeMoivre's Theorem to raise complex numbers to higher powers by raising r to that power and multiplying θ by that power.

11-4

- Know how to find roots of complex numbers.
- If you are finding the nth root, there should be n solutions, all equally spaced out on the graph 360˚/n degrees apart.
- Find the first root by raising r to the 1/n power and dividing θ/n. Find the other roots by adding 360˚/n until you have n roots.

Other pieces of useful information:

- Know that $\bar{z} = r(cos\theta - isin\theta)$ is the conjugate of a complex number. Know what kinds of problems have required the use of the conjugate and what effect multiplying by the conjugate has.
- Know that $|z| = |a + bi|$, the absolute value of a complex number, is defined as the positive distance from the origin to the point on the complex plane. In other words, it can be evaluated by giving the positive r value for the complex number.