

MATH 1012 (Ng/Fall 2010)
Review for Comprehensive Final Examination
Exam will cover up to and including 8.3
Exam will be on Wednesday Dec 15 at 8:30am till 10:30pm
for class on December 10, 2010.

1. **Reviews for exam 1,2, 3 & 4**

2. **Solving systems of equations**

- (a) You should know how to solve a system of equations by either the *elimination* or the *substitution* methods,
- (b) You should know how to **algebraically** solve a system of equations.
- (c) you should understand that the solution(s) to a system of equations are the **points of intersection** of the curves defined by all the equations.

3. **Conic sections: Parabolas**

- (a) Given an equation of a parabola, you must know how to :
 - i. find its vertex, (h, k) ,
 - ii. find its focal length p ,
 - iii. find its focus point,
 - iv. find the equation of its directrix,
 - v. determine if the parabola is opening *up, down, to the right, or to the left*,
 - vi. sketch the graph of the parabola without using a graphing calculator.
- (b) Given enough information about a parabola, you should be able to construct the equation of the parabola.

4. **Conic sections: Ellipses**

- (a) Given an equation of an ellipse, you must know how to :
 - i. find its center vertex, (h, k) ,
 - ii. find both of its vertices,
 - iii. find both of its focal points,
 - iv. find the length of its semi-major axis, a ,
 - v. find the length of its semi-minor axis, b ,
 - vi. find the distance, c , between the center and the focus point; (note that $a^2 = b^2 + c^2$),
 - vii. determine if the ellipse is standing *horizontally* or *upright*, i.e. if the major axis is horizontal or vertical,
 - viii. sketch the graph of the ellipse without using a graphing calculator.
- (b) Given enough information about an ellipse, you should be able to construct the equation of the ellipse.

5. **Conic sections: Hyperbolas**

- (a) Given an equation of a hyperbola, you must know how to :
 - i. find its center vertex, (h, k) ,
 - ii. find both of its vertices,
 - iii. find both of its focal points,
 - iv. find the length of its semitransverse axis, a ,
 - v. find the length of its semiconjugate axis, b ,
 - vi. find the distance, c , between the center and a vertex point; (note that $c^2 = a^2 + b^2$),
 - vii. find the equations of the asymptotes,
 - viii. determine if the hyperbola is opening *sideways* or *up/down*, i.e. if the transverse axis is horizontal or vertical,
 - ix. sketch the graph of the ellipse without using a graphing calculator.
- (b) Given enough information about a hyperbola, you should be able to construct the equation of the hyperbola.

6. Please go through all the problems in your homework and those that I did in class from 7.1 onwards