

MTH 114, Exam 1, Fall 2003
1:00 – 2:15 pm, Oct. 9, 2003
Instructor: Govind Menon

Your Name: _____

Please circle your TA's name and your section:

Liming Lin 1:20pm 2:25 pm
Tal Sutton 9:55 am 11:00 am
Yudong Tang 12:05pm 3:30 pm
Jiayou Wang 7:45am 8:50 am

Q.1	
Q.2	
Q.3	
Q.4	
Q.5	
Q.6	
Total	

Scaled total: _____

Instructions

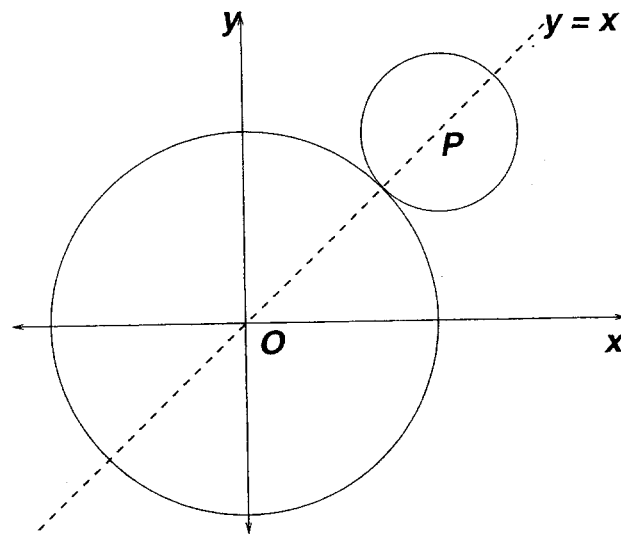
1. Answer as many questions as you can. This exam is graded on a curve and the mean will be scaled to 70/100. Do not spend too much time on any one problem.
2. **Show your work** : you may get partial credit.
3. No books or notes of any kind are allowed.
4. You may use a calculator, but not a graphing calculator.
5. This exam is worth 20% of your course grade.

Question 1: (10 points) Use synthetic division to determine if -2 is a root for the polynomial

$$f(x) = 3x^4 + 8x^3 - 2x^2 - 10x + 4.$$

Question 2: (10 points) Sketch the graph of the polynomial

$$f(x) = (x - 1)^2(x - 5)$$



Question 3: The center of both circles lie on the line $y = x$. The larger circle has radius 5 and the smaller circle has radius 2.

- (a) (10 points) Find the equation for the big circle.
- (b) (10 points) Find the equation for the small circle.

Question 4: (20 points) Solve the equation

$$x + \sqrt{5x + 19} = -1.$$

(Hints: (a) simplify the expression by squaring both sides until you get a quadratic equation in x ; (b) check your answers).

Question 5: (20 points) Sketch the graph of the function

$$f(x) = x^2 - 6x.$$

Indicate clearly the zeros of f , and the point where f is minimum.

Question 6: When a basketball player leaps straight up for a dunk, the player's distance off the floor after t seconds is given by

$$f(t) = -16t^2 + 16t.$$

- (a) (10 points) Find the player's hang time, that is, the total number of seconds that the player is in the air.
- (b) (10 points) Find the player's vertical leap, that is, the maximum height of the player off the ground.