Math 1031 Test 2 Wednesday, November 1, 2000.

Professor Peter A. Rejto

Name (Print): _____ Student ID number: _____
Section number: _____ Name of TA: _____
Signature: _____

7 pages. Show all work. No work no credit. No books/notes. Calculators: Scientific calculator are allowed. However, graphing calculators are not allowed. More specificaly, calculators that display two or more lines are not allowed.

Additional Information:

1. If your answer involves one or more symbols, please define them. If you have an answer, there is no need to write it as a decimal number.

2. Let E and F be events in the same sample space. Recall that $P(E/F)$, the conditional probability of E with condition F is defined by:

$$P(E/F) = \frac{P(E \cap F)}{P(F)}.$$

Here, as ususal, $E \cap F$ denotes the intersection of the sets E and F, $P(E \cap F)$ is the probability of this intersection and $P(F)$ is the probability of F.

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1. (15 pts.) A certain club consists of 6 men and 5 women. How many ways are there to form a committee of 6 people if a certain pair of men refuse to serve on the same committee? Hint: one way to solve this problem is to count the total number of committes, and then subtract the number for which both men are members.

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2. (15 pts.)

   (a) (5 pts.) Suppose that you deposit $100.00 into a savings account which pays 5% interest compounded annually. What is your balance after 1 year?

   (b) (5 pts.) Under the assumptions of part (a), what is your balance after 2 years?

   (c) (5 pts.) Suppose that you deposit $100.00 into a savings account which pays 5% interest compounded semi annually. What is your balance after 2 years?

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3. (20 pts.)

   (a) (10 pts.) Solve the quadratic equation,

   $$x^2 + bx - 1 = 0.$$

   (b) (10 pts.) Derive, from first principles, the solution formula for the quadratic equation of part (a).

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4. (15 pts.)

(a) (8 pts.) Solve the equation,

$$36t^4 + 29t^2 - 7 = 0$$

(b) (7 pts.) Solve the equation,

$$(x^2 - x - 22)^{\frac{2}{3}} = 16.$$

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5. (15 pts.) Solve the inequality:

$$\frac{5+7x}{1+2x} < 4.$$

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6. (20 pts.)

   (a) (10 pts.) Find the center and radius of the circle:

   $$4x^2 + 4y^2 - 4x + 2y - 1 = 0.$$

   (b) (10 pts.) Let L_1 be the line through the pair of points: $(0, 0)$, $(1, 1)$. Similarly, let L_2 be the line through the pair of points: $(0, 0)$, $(1, -1)$. First, find the equations of these two lines. Second, show that these two lines are perpendicular.