

# Math 1351 Test 1

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Name \_\_\_\_\_

## Exam Guidelines

- Do not open this exam until are instructed to begin.
- Follow all instructions explicitly.
- Before you begin working, make sure your test has 5 numbered problems and a bonus question.
- You will have exactly 80 to complete the exam after I say to begin.
- Failing to write your name in the specified area on this test will result in a loss of 10 points.
- Absolutely NO notes or books may be used on this exam.
- You must show all necessary work to receive full credit for a problem.
- This exam will be graded out of 100 points.
- When you are finished with your exam, please turn it in at the front of the room and quietly exit.

A formula you might find helpful: You + Cheat = Fail

Good Luck!

February 23, 2006

**Answer each of the following:**

- a. What is the formula used to find n Permutations k ways? i.e.  $({}_nP_k)$
  
- b. What is the formula used to find n Combinations k ways? i.e.  $({}_nC_k)$
  
- c. What does the ! symbol stand for? What does n! equal? 0!?
  
- d. When do we use permutations vs. combinations?
  
- e. What does it mean for a game to be fair?
  
- f. What does it mean for 2 events to be independent?
  
- g. Explain how to find the mean, median, and mode of a set of data.
  - i. Mean
  
  - ii. Median
  
  - iii. Mode
  
- h. Explain how to find the standard deviation of a set of data.





4. Before you are able to start your new job the employer requires you to take (and pass) a drug test. They know that on average 15% of every 10000 people they hire use illicit drugs. If a person using drugs takes the test there is a 96% chance that they will test positive (i.e. positive for drugs in their system). Unfortunately, the test will also give a positive result 3% of the time for those who do not use drugs. Use this information to answer the following questions.

- a. Complete the following chart

	Drug User	Not a Drug User
Test Positive		
Test Negative		

- b. Given someone does not use drugs, what is the probability they will test positive?

- c. Given someone tests positive, what is the probability they don't use drugs?

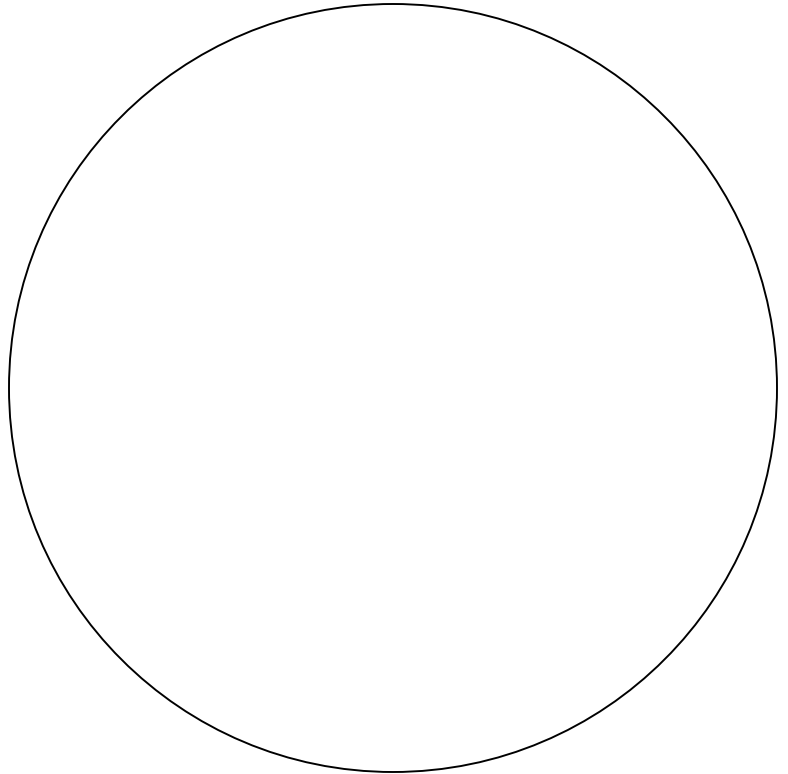
- d. Given someone tests negative, what is the probability they use drugs?

- e. What is a bigger concern for the company? A false positive or a false negative? Why?

**5. Use the following information to answer the questions.**

Winter Olympics Current Medal Count				
	Gold	Silver	Bronze	Total
Germany	9	8	5	22
Austria	8	6	5	19
United States	7	7	4	18
Canada	5	8	5	18
Norway	2	8	8	18
Russia	7	3	6	16
Switzerland	4	3	4	10
Sweden	4	2	4	10
Italy	4	0	6	10
South Korea	4	3	1	8
France	3	2	3	8
China	1	3	4	8
Netherlands	2	2	3	7
Finland	0	3	3	6
Estonia	3	0	0	3
Croatia	1	2	0	3
Australia	1	0	1	2
Czech Republic	0	2	0	2
Ukraine	0	0	2	2
Bulgaria	0	1	0	1
Great Britain	0	1	0	1
Slovakia	0	1	0	1
Latvia	0	0	1	1

a. Using the information in the chart make a pie chart showing total medals by country.



b. Draw a scatter plot showing gold medals vs. total medals

**Bonus: Answer the following question completely. You must show all work. A correct well-justified answer will receive a grade of 5 points. Anything else will not receive credit.**

Before Marge went to the store she checked the cookie jar to see if the family needed more cookies. As soon as she left, Homer, who was hungry, ate half the cookies. Then

Bart came along and ate a third of what was left in the jar. Next, Lisa came by and decided to take a fourth of the remaining cookies with her to class. Then Maggie crawled by and took a cookie to eat. When Marge returned from the store she noticed that only 2 cookies remained. How many cookies were in the jar when Marge first checked?

As Ben is preparing to go to school in the morning his power goes out and leaves his house in darkness. He was just about to head out the door when this happened, but, he still had not had time to pick out a pair of shoes. Ben wants to make sure he has a matching pair but he can't see anything. The other problem is that Ben pretty much wears Reebok Classic Ballistic EXT's so all his shoes feel the same. Ben knows he has 11 pairs of these in the closet and wants to make sure he has a matching pair. What is the fewest number of shoes Ben needs to take to his car to make sure he ends up with a matching pair? Why?

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Do not remove from your test packet.**

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