

M480 handout

Math 483

Quiz 1 Fall 2003

2015

Name \_\_\_\_\_

1) According to the US Census, 140 million Americans are female and 135 million Americans are male. What is the probability that a randomly selected American is female?

$$\frac{140}{135+140} = \frac{140}{275} = .5091$$

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-4 if .49

-29  
-1/4

Use the following information for problems 2) and 3). When Germany bombed London in World War II, a rumor was spread that the bombs were guided. To test this claim, intelligence divided London into 576 regions of 0.25 square kilometers each. If the bombs were hitting at random, then the number of hits would have the probabilities given below. (It turned out that the bombs were indeed falling at random.)

# of hits in a region	0	1	2	3	4 or more
probability	0.40	0.37	?	0.06	0.01

2) What was the probability of a region getting 2 hits?

$$1 - .4 - .37 - .01 = 1 - .84 = 0.16$$

0.16

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3) What was the probability of a region getting at most two hits (2 or fewer hits)?

$$.4 + .37 + .16 = 1 - .06 - .01 = .93$$

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4) In how many ways can a committee consisting of three men and two women be chosen from a group of seven men and five women? Do ~~not~~ simplify the appropriate symbol(s).

$$\frac{\binom{7}{3} \cdot \binom{5}{2}}{3M \cdot 2W} = \frac{7!}{3!4!} \cdot \frac{5!}{2!3!} = \frac{7 \cdot 6 \cdot 5}{3 \cdot 2} \cdot \frac{5 \cdot 4}{2} = 350$$

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-4  $P_3^7 P_2^5$   
x200

↑  
fast to mult, -5

Prob -4

5) Suppose you can use the math photocopier if you have a password. If the password consists of a letter (A to Z) followed by 2 digits (0 - 9), then how many passwords are possible if the 2 digits must be different?

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$$\frac{26}{\text{letter}} \cdot \frac{10}{\text{digit}} \cdot \frac{9}{\text{digit}} = \underline{2340}$$

$$26(10^2) - 5$$

→ if mult 2 things

→ 6) From 1500 lottery tickets sold, 3 tickets are selected for first, second, and third prizes. How many possible outcomes are there?

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$$\frac{1500}{1st} \cdot \frac{1499}{2nd} \cdot \frac{1498}{3rd}$$

$$= P_3^{1500} = 3.3683 \times 10^9$$

(1500)  
4  
15000  
3 prize  
winner

(15)  
(3) - 5  
too small by a factor of 6

$$= \frac{1500!}{1497!} \approx 3,368,300,000 \approx 3,368,253,000$$

7) A 4 sided die is rolled twice and the product of the resulting two tosses is taken.

a) List all possibilities in the table below

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2nd roll	1st roll			
	1	2	3	4
1	1	2	3	4
2	2	4	6	8
3	3	6	9	12
4	4	8	12	16

Pairing -

b) What is the chance that the product of the two rolls is four?

$$\frac{3}{16} = 0.1875$$

$$\frac{10 \times 2}{16} = 6$$