

Chapter 4 and 5 Test Review

- 1) (25 points) Using the table below of AGI answer the following questions:
- What is the probability of a return having an AGI under \$10K?
 - What is the probability of an AGI greater than \$30k but less than \$100k?
 - What is the probability of an AGI not being greater than \$100K?
 - If Event H shows an AGI between \$20K and \$100K and Event I show an AGI less than \$50K. What is the probability of H & I?
 - If Event H shows an AGI between \$20K and \$100K and Event I show an AGI less than \$50K. What is the probability of H or I?

Table 4.16 Adjusted gross incomes

Adjusted gross income	Frequency (1000s)	Event	Probability
Under \$10K	26,268	<i>A</i>	
\$10K–under \$20K	22,778	<i>B</i>	
\$20K–under \$30K	18,610	<i>C</i>	
\$30K–under \$40K	14,554	<i>D</i>	
\$40K–under \$50K	11,087	<i>E</i>	
\$50K–under \$100K	30,926	<i>F</i>	
\$100K & over	18,227	<i>G</i>	
	142,450		

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- 2) (25 points) Using the following table with Age and Living Arrangements answer the following questions:
- What is the probability that a person selected lives with a spouse?
 - What is the probability that a person selected is over 64?
 - What is the probability that a person selected lives with a spouse and is over 64?
 - What is the probability that a person selected lives with a spouse given that they are over 64?
 - What is the probability that a person selected is over 64 given they live with a spouse?

		Living arrangement			
		Alone L_1	With spouse L_2	With others L_3	$P(A_i)$
Age (yr)	15-24 A_1	0.006	0.012	0.157	0.175
	25-44 A_2	0.030	0.184	0.123	0.337
	45-64 A_3	0.047	0.216	0.067	0.330
	Over 64 A_4	0.046	0.088	0.024	0.158
	$P(L_j)$	0.129	0.500	0.371	1.000

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- 3) (9 points) In the United States, telephone numbers consist of a three-digit area code followed by a seven-digit local number. Suppose neither the first digit of an area code nor the first digit of a local number can be a zero but that all other choices are acceptable.
- a. How many different area codes are possible?
 - b. For a given area code, how many local telephone numbers are possible?
 - c. How many telephone numbers are possible?

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- 4) (6 points) Investment firms usually have a large selection of mutual funds from which an investor can choose. One such firm has 30 mutual funds. Suppose that you plan to invest in four of these mutual funds, one during each quarter of next year. In how many different ways can you make these four investments?

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- 5) (15 points) An office has six incoming phone lines. The probability distribution of the number of busy lines are as follows:

y	0	1	2	3	4	5	6
$P(Y = y)$	0.052	0.154	0.232	0.240	0.174	0.105	0.043

- What is the probability of 4 lines being busy?
- What is the probability of between 2 and 4 lines (inclusive) are busy?
- On average how many lines are busy?

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- 6) (20 points) According to *JAVMA News*, a publication of the American Veterinary Medical Association, roughly 60% of U.S. households own one or more pets. Four U.S. households are selected at random.
- a. Find the probability that of the four households the number that own one or more pets is exactly 3?
 - b. Find the probability that of the four households the number that own one or more pets is at least 3?
 - c. Find the probability that of the four households the number that own one or more pets is at most 3?