MATH 328: Practice Midterm 2

Show all appropriate work.

1. Given that party affiliation and age are independent, fill in the following chart.

Age/Party	Republican	Democrat	Independent	Any Affiliation
Under 30				.25
30 to 50				.30
Over 50				.45
Any Age	.30	.4	.3	1

2. A wine rack contains 6 bottles of Chablis, 5 bottles of Burgundy, and 4 bottles of Riesling. Four bottles are randomly selected.
   (a) What is the probability that exactly 4 are Riesling?
   (b) What is the probability that there is at least one of each type?
   (c) Given that at least one of the bottles is a Chablis, what is the probability that all of them are Chablis?
   (d) Suppose bottles are selected one by one until a Burgundy is found. What is the probability that it is necessary to examine exactly 5 bottles?

3. A midterm test is given in a class having 19 men and 10 women. If all students are equally smart what is the probability that the first woman to finish the test would be the third person to finish?

4. A matchbox contains 20 brown and 10 yellow matches. A mathematician chooses matches at random one-by-one until only one color is left.
   (a) Find the probability that 5 brown matches are left.
   (b) Find the probability that 5 matches are left.
   (c) Find the probability that only brown matches are left at the end.

5. An eight-card hand is dealt from an ordinary deck of cards. Find the probability that
   (a) All eight card are spades.
   (b) There are four cards in one suit and the other four cards are in another suit.