APStatistics 

## Unit 6 Probability Free Response

**Directions:** Complete the assignment on this paper. Your answers for this assignment must include reasons; simply stating the answer without justification will earn partial credit.

1. One hundred shoppers at a local shopping mall were categorized by age and gender.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Under 25** | **25-40** | **Over 40** | **Total** |
| **Male** | **15** | **13** | **12** | **40** |
| **Female** | **24** | **18** | **18** | **60** |
| **Total** | **39** | **31** | **30** | **100** |

1. What proportion of shoppers are males under 25? (3 points)

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1. Let A be the event the shopper is male. Let B be the event the shopper is over 40 years old. Are events A and B mutually exclusive? (4 points)

1. If a randomly selected shopper is female, what is the probability that she is 25 to 40 years old? (4 points)

1. A box contains one red, three blue, and two green marbles. Two marbles are selected in succession (i.e., without replacement) at random.

 Let R = {the selected marble is red}

B = {the selected marble is blue}

G = {the selected marble is green}

C = {both marbles selected are the same color}

D = {at least one of the marbles is blue}

* 1. Find P(C) (3 points)

* 1. Find P(D) (3 points)

* 1. Find P(C and D) (4 points)

* 1. Find P(C or D) (4 points)

* 1. Find P(D|C) (4 points)

1. A laboratory test for a disease afflicting 5% of the population is either positive, indicating the disease is present, or negative, indicating the disease is not present. When people having the disease are tested, 80% of the tests come back positive, and when people who don’t have the disease are tested, 15% of the tests come back from the lab marked positive (a “false positive” result). What are the chance a randomly selected person’s test results would come back positive? Use a tree diagram and construct a probability distribution table. (18 points)