Math 111 First Probability Worksheet SOLUTIONS

Print **all** group member's names here. Circle the name of the group member who turns this in.

1. Which of these are continuous (C) and which are discrete (D)?

C The weight of a pail of water.   D The number of ears of corn produced.

D Molecules in a pail of water.   D The number of green M&M's in a bag.

C The speed of a car in mph.   C The time it takes for a car battery to die.

C The height of corn plants.

2. A survey of automobiles parked on a university campus lot classified the brands by country of origin and by the type of parking permit (student or faculty/staff).

	American car	European car	Asian car
student	25	10	15
faculty/staff	9	4	12

a. How many cars were in the lot? $\boxed{75 \text{ cars}}$

Suppose we choose a car at random. Let S be the event that the car belongs to a student, let A be the event that the car is an American car. Find the following probabilities (leave your answer as fractions; no need to reduce):

b. $P(S) = \boxed{50/75}$ or $2/3$

c. $P(A) = \boxed{34/75}$

d. $P(\bar{S}) = 1 - \frac{50}{75} = \boxed{\frac{25}{75}}$ or $\frac{1}{3}$

e. $P(\bar{A}) = 1 - \frac{34}{75} = \boxed{\frac{41}{75}}$

f. $P(A \cap S) = \boxed{25/75}$ or $\frac{1}{3}$

g. $P(A \cup S) = \boxed{59/75}$

3. A special deck of cards has five suits (red, yellow, green, black, purple), each with ranks 1 through 9.

a. How many cards are in this deck? $5 \cdot 9 = \boxed{45 \text{ cards}}$

Suppose we draw a card at random. Let R be the event that the card is red. Let E be the event that the card we draw has rank 8. Find the following probabilities (leave your answer as fractions; no need to reduce). Also, express these using the appropriate probability notation.

b. The probability the card is red: $P(R) = \frac{1}{5}$ or $\frac{9}{45}$

c. The probability the card is not an eight: $P(\bar{E}) = \frac{8}{9}$ or $\frac{40}{45}$

d. The probability the card is a red eight: $P(R \cap E) = \frac{1}{45}$

e. The probability that the card is either red or an 8 (or both)

$$P(R \cup E) = P(R) + P(E) - P(R \cap E)$$
$$= \frac{9}{45} + \frac{5}{45} - \frac{1}{45} = \boxed{\frac{13}{45}}$$