Probability Worksheet #1
September 21, 2018
2 Points

Circle one name.

Name: Solutions **Name:** _____ **Name:** _____

Note: If A and B are two subsets of a set X, then:

- $\overline{A}$ is the set of members of X that are *not* in A (the *complement* of A).
- $A \cup B$ is the set of members of X that are in A *or* in B (*or both*) (the *union* of A and B).
- $A \cap B$ is the set of members of X that are in A *and* also in B (the *intersection* of A and B).

1. 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	= 50
faculty/staff	9	4	12	= 25
	34	14	27	

   (a) How many cars were in the lot? 75

   (b) 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 simplify):

   i. $P(S)$ $\frac{50}{75} = \frac{2}{3}$
   ii. $P(A)$ $34/75$
   iii. $P(\overline{S})$ $25/75 = 1/3 \rightarrow 75/75 - 50/75$
   iv. $P(\overline{A})$ $41/75 \rightarrow 75/75 - 34/75$
   v. $P(A \cap S)$ $25/75 \Rightarrow 1/3$
   vi. $P(A \cup S)$ $59/75$

2. 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? 45 -> 5 suits × 9 ranks

   (b) 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 simplify). Also, express these using the appropriate probability notation.

      i. The probability the card is red: $9/45 = \frac{1}{5}$

      ii. The probability the card is not an eight: $40/45 = 8/9$

      iii. The probability the card is a red eight: $1/45$

      iv. The probability that the card is either red or an 8 (or both): $13/45$