## Foundations 12: Probability Quiz \#2

$P(A \cup B)=P(A)+P(B)-P(A \cap B)$ $P(A \cap B)=P(A) \cdot P(B \mid A)$
Full credit will only be awarded for all work shown in a neat and organized manner. For probabilities, answer with percentages to 2 decimal places, if needed (e.g. 14.56\%)

In a deck of cards there are...

- 52 cards total
- 13 cards of each suit (Clubs, Spades, Hearts Diamonds)
- 26 black cards (Clubs and Spades)
- 26 red cards (Hearts and Diamonds)
- 4 Cards of each type
(A, 2-10, J, Q, K)

1. Two cards are drawn from a standard deck without replacement. Determine:
a. $P($ The first is a red Jack, and the second is a 10$)=$
b. $P($ One card is red and one card is black) $=$
c. $\quad \mathrm{P}($ No Aces $)=$
d. $P($ Both cards are a different number/letter $)=$
2. A carnival game uses a bag that contains 3 red marbles, 5 blue marbles and 6 green marbles. It costs $\$ 1.50$ to pick a marble. A red marble is worth $\$ 5$, a blue marble is worth $\$ 1$, and a green marble is worth $\$ 0.50$. Would you play this game? Justify your answer mathematically.
3. When you get fouled in basketball, you get to take 2 shots ("Free-Throws"). On his first shot, Mr. G makes $72 \%$ of his free-throws. If he misses his first shot, the probability of making it goes down by $10 \%$. If he makes his first shot, the probability of making the second shot goes up $5 \%$.
a. Draw a tree diagram to represent this situation
b. $P($ Makes both shots $)=$
c. $P($ Makes exactly 1 shot $)=$
d. $P($ Makes his second shot $\mid$ missed his first shot $)=$
4. In a class of 30 students, 22 students have dark hair and 16 of the dark hair students are right-handed. The rest of the students have blonde hair and 3 of the blonde students are left-handed.
(Leave answers b. to e. as fractions. You don't need to reduce them)
a. Complete the table below

|  | Right-Handed (RH) | Left-Handed (LH) | Total |
| :--- | :---: | :---: | :---: |
| Dark Hair (D) |  |  |  |
| Blonde Hair (B) |  |  | 30 |
| Total |  |  |  |
| b. P(D $\cap \mathrm{H})=$ |  |  |  |

b. $P(D \cap L H)=$
c. $P(\mathrm{LH} \cup B)=$
d. $P(D \mid R H)=$
e. $P\left(R H \cap B^{\prime}\right)=$
f. In this class, are being right-handed and having dark hair independent? Explain.

