9.3 Probability HW WS

1. Scott and Brad are competing with a third contestant on Fear Factor who just scored a time of 45 seconds on the last task. Scott believes that he has a 0.85 probability of beating the time and Brad thinks that he has a .60 probability of beating the time. What is the probability that: (leave these in decimals)
a. Scott does not beat the time?

$$
1-.85
$$

a. $\qquad$
b. Scott beats the time and Brad does not beat the time?

$$
(.85) \cdot(.40)
$$

c. Neither one beats the time?

$$
(\sim S)(\sim B) \quad(.15)(.4)
$$

C. $\qquad$
d. At least one beats the time?

Scott, Not Brad or Brad, Not Scott, or Both

$$
.34+.6(.15)+.85(.6)=
$$


$\qquad$
$\qquad$
d. $\qquad$ 1-neither!
2. Given the word SKETCHPAD: 9 letters ( $2 v, 7 c$ )
a. How many 5 -letter "words" can you create without repeating?

$$
{ }_{9} P_{5}=9 \cdot 8 \cdot 7 \cdot 6 \cdot 5=15120
$$

a. 15120
b. What is the probability that your 5 -letter word will have 2 vowels?

$$
\frac{2}{v} \frac{1}{v} I \underline{5}
$$

b.

$q^{P} 5$

3. Metropolis is a really cool place to live, but the 5 digit addresses are created using the following rules.

- The first digit cannot be a 0 or 1
- The second digit has no restrictions
- The third digit must be even (0 is even)
- The fourth digit can must be 6 or less
- The last digit must be a 0 or 5
a. How many possible addresses exist in Metropolis?

$$
810572
$$

a. 5600
b. If a 5 digit number is chosen at random, what is the probability the it will be a valid address in Metropolis?

$$
\frac{5600}{100,000}=\frac{7}{125}
$$

Sample Space: $1010101010=10^{5}=1000000^{\mathrm{b}}$ $\qquad$
4. 12 Hinsdale Central high school students, 7 boys and 5 girls, are going on spring break to Springfield together. When they get there they want to go sight seeing but they are only allowed to go in groups of 7 .
a. What is the total amount ofrounsthey can form?

$$
{ }_{12} C_{7}
$$

b. What is the probability of forming a group with 4 girls?

$$
\text { (so3boys) } \frac{{ }_{5} C_{4} \cdot{ }_{7} C_{3}}{{ }_{12} C_{7}}=\frac{5.35}{792}
$$

a. $\qquad$ 792
c. What is the probability of forming a group of at least 4 boys?

$$
\begin{array}{r}
\frac{4 \text { boys }{ }_{7} C_{4} \cdot{ }_{5} C_{3}+{ }_{7} C_{5} \cdot{ }_{5} C_{2}+{ }_{2} C_{6} \cdot{ }_{5} C_{1}+{ }_{7} C_{7} \cdot{ }_{5} C_{0}}{{ }_{12} C_{7}}=\frac{350+210+35+1}{792} \\
\quad \frac{596}{} \frac{507}{}=\frac{149}{198} \approx 75 \%
\end{array}
$$

5. There are two identical cookie jars. Jar A contains 2 chocolate chip cookies and 5 peanut butter cookies. Jar B contains 1 chocolate chip cookie .t I pb cookie.
a. Jenny picks out one cookie. What is the probability that she drew a chocolate chip cookie?

$$
.5\left(\frac{2}{7}\right)+.5(.5)=.39
$$

Gwen Condition
b. Suppose the cookie Jenny drew was chocolate chip. What is the probability that it came from Jar A?


$$
\begin{aligned}
P\left(A \mid e^{2} C\right) & =\frac{P(A \text { and } C C)}{P(C C)} \\
& =\frac{.5\left(\frac{2}{7}\right)}{.39}=.36
\end{aligned}
$$

