

# Statistics and Probability

1.) 6 - w/ 4 choices

• 4 true/false

$$4^6 \cdot 2^4 = \boxed{65,536}$$

2.) Permutation: order matters

$$40P_3 = \boxed{59,280}$$

3.) Combination: order doesn't matter

$$25C_4 = \boxed{12,650}$$

4.) CARELESSNESS  
3 E's & 4 S's

$$\rightarrow \frac{12!}{3!4!} = \boxed{3,326,400}$$

5.) 6 - \$1

4 - \$5

2 - \$10

3 - \$20

$$P(\geq 5) = \frac{9}{15} = \boxed{\frac{3}{5}}$$

6.) 3 - cheese

7 - pep

5 - supreme

15 - total

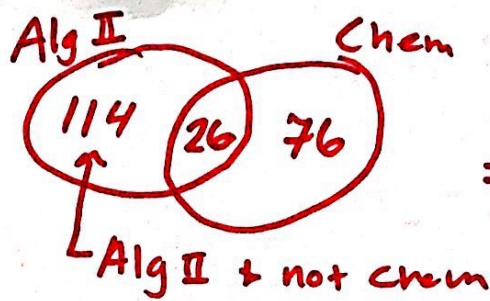
$$P(\text{cheese then supreme}) = \frac{3}{15} \cdot \frac{5}{14}$$

$$= \boxed{\frac{1}{14}}$$

$$7.) P(\text{two peps}) = \frac{7}{15} \cdot \frac{6}{14} = \boxed{\frac{1}{5}}$$



- 8.) total - 318  
 Alg II - ~~102~~ 140  
 Chem - 102



Not chem  
 $= 318 - 102$   
 $216$

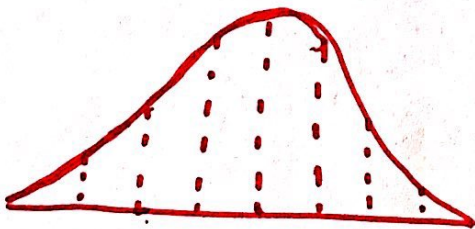
$P(\text{takes Alg} \mid \text{Not chem}) = \frac{114}{216} = \boxed{\frac{19}{36}}$

9.)  $P(\text{a male that own an android}) = \boxed{\frac{34}{125}}$

b.)  $P(\text{apple} \mid \text{male}) = \frac{30}{64} = \boxed{\frac{15}{32}}$

c.)  $P(\text{female} \mid \text{android}) = \boxed{\frac{19}{53}}$

10.)



21 23 25 27 29 31 33

$-3\sigma - 2\sigma - \sigma \mu \sigma 2\sigma 3\sigma$

a)  $13.6 + 34.1 = \boxed{47.7\%}$

b.)  $P(\geq 31) = 2.2 + 0.1 = \boxed{2.3\%}$

c.)  $\leq 29 = 50\% + 34.1\%$   
 $= 84.1\%$

$32(.841) = 26.91 \rightarrow \boxed{26 \text{ recruits}}$

11.  $\mu = 45$   
 $\sigma = 10.71$   
 $\text{med} = 43$   
 $\sigma^2 = 114.70$

## 11. Experiment

$$\begin{aligned} 12. (a-2)^9 &\rightarrow \sum_{k=0}^9 {}^9C_k a^{9-k} (-2)^k \\ &= a^9 - 18a^8 + 144a^7 - 672a^6 + 2016a^5 - 4032a^4 \\ &\quad + 5376a^3 - 4608a^2 + 2304a - 512 \end{aligned}$$

$$\begin{aligned} 13. (4k+1)^5 &\rightarrow \sum_{a=0}^5 {}^5C_a (4k)^{5-a} (1)^a \\ &= 1024k^5 + 1280k^4 + 640k^3 + 160k^2 + 20k + 1 \end{aligned}$$