ALG2: Probability PRACTICE 20/20 **Name:** Key 3/3/2020

1. Joe has 5 shirts, 6 trousers, 3 ties, and 4 sport coats. How many different arrangements can he wear?

$5 \times 6 \times 3 \times 4 = 360$ outfits

2. How many different 4-letter radio station call letters can be made if the first letter must be a K *or* W and no letter may be repeated?

$2 \cdot 25 \cdot 24 \cdot 23 = 27{,}600$

3. For many years the state of California used 3 letters followed by 3 digits on its automobile license plates. How many different license plates are possible with this arrangement?

$26 \cdot 26 \cdot 26 \cdot 10 \cdot 10 \cdot 10 = 17{,}576{,}000$

4. A baseball team has 15 players. How many 9-player batting orders are possible

$15P9 = 1{,}816{,}214{,}400$ Hard to believe!

5. A student activity club at the college has 32 members. In how many different ways can the club select a president, a vice president, a treasurer, and a secretary?

$32P4 = 863040$

6. A class has 10 male students and 12 female students. How many ways can the class select a committee of four people to petition the teacher not to make the final exam cumulative if the committee has to have exactly 2 males and 2 females?

$10C_2 \cdot {}_{12}C_2 = 2{,}970$

7. Calculate the number of ways you can arrange the letters of the word: SANDWICH

$8!$ or $8P8 = 40{,}320$

8. How many ways can you select a 4-digit pin number if the first digit cannot be a zero.

$9 \cdot 10 \cdot 10 \cdot 10 = 9{,}000$

9. Two cards are selected from a standard deck of 52 cards, one after the other without replacement. What is the probability that the two cards are both face cards?

$\frac{12}{52} \cdot \frac{11}{51} = \frac{132}{2652} \approx 5\%$

10. A single 6-sided die is rolled once and a single card is drawn from a standard deck of 52 cards. What is the probability that the die shows a result greater than 3 and the card is a heart?

$\frac{3}{6} \cdot \frac{13}{52} = \frac{39}{312} \approx 12.5\%$

11. A special deck of cards contains only the face cards and aces from a standard deck of cards.
    a) If one card is dealt, what is the probability that the card is an ace?
    b) If one card is dealt, what is the probability that the card is a black ace?
    c) If two cards are dealt, what is the probability that both cards are face cards?

12 face + 4 Aces = 16 cards

a.) $\frac{4}{16} = 25\%$ b.) $\frac{2}{16} = 12.5\%$ c.) $\frac{12}{16} \cdot \frac{11}{15} = \frac{132}{240} = 55\%$