INSTRUCTOR: MR BRICE
DATE: 04/23/2019
NOTES TAKER: Enoch.

Math 1332

Express answers as decimals rounded to five decimal places. Circle your answers.

1) What is the probability of choosing a face card and then a club from a standard deck of cards with replacement?

$P(\text{Face card}) = \frac{12}{52}$, $P(\text{club}) = \frac{13}{52}$,

$P(\text{Face card and club}) = \frac{12}{52} \times \frac{13}{52} = 0.05769.$

2) What is the probability of choosing two tens in a row from a standard deck of cards without replacement?

$$\frac{4}{52} \times \frac{3}{51} = 0.00452.$$

3) You roll a pair of Christmas dice (one red, one green). What is the probability of rolling a pair of dice and having at least one 4 showing? (Be careful not to count the same event twice!)

1,1	1,2	1,3	1,4	1,5	1,6
2,1	2,2	2,3	2,4	2,5	2,6
3,1	3,2	3,3	3,4	3,5	3,6
4,1	4,2	4,3	4,4	4,5	4,6
5,1	5,2	5,3	5,4	5,5	5,6
6,1	6,2	6,3	6,4	6,5	6,6

$\frac{11}{36} = .30556$

Do not count 4,4 twice.

Of rolling twice and getting a total of 10 both times?

$$\frac{3}{36} \times \frac{3}{36} = 0.00694$$

4) Joyce keeps a cup of change in her car. This morning there were 31 pennies, 11 quarters, 8 nickels, and 12 dimes in the cup. What is the probability that she randomly removes a nickel and then a quarter from the cup (without replacement)?

$$\frac{8}{62} \times \frac{11}{61} = 0.02327$$

* What is the probability that she grabs 4 coins from the cup and they are all nickels?

$$\frac{8}{62} \times \frac{7}{61} \times \frac{6}{60} \times \frac{5}{59} = 0.00013$$

5) The weather forecast for your week-long vacation was for a 20% chance of rain each day, yet it rained every day! What was the probability of this happening?

$$\frac{1}{5} \cdot \frac{1}{5} \cdot \frac{1}{5} \cdot \frac{1}{5} \cdot \frac{1}{5} \cdot \frac{1}{5} \cdot \frac{1}{5} = (0.2)^7 = 0.00001$$

6) There are 8 children, four boys and four girls, singing in the Christmas program. As they line up to perform, the choral director insists that the first person (far left) be a girl and the last person (far right) be a boy. How many ways can the children line up? (Hint: You may want to put 8 blanks in a row to fill in.)

$$\underline{4} \cdot \underline{6} \cdot \underline{5} \cdot \underline{4} \cdot \underline{3} \cdot \underline{2} \cdot \underline{1} \cdot \underline{4}$$

7) Colby is choosing a password for his new computer. It requires three letters (none repeated) followed by 3 digits (which may be repeated). How many different possible passwords are there to choose from?

$26 \cdot 25 \cdot 24 \cdot 10 \cdot 10 \cdot 10$

8) Compute the following:

$7! = 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$

$\frac{6!}{4!} = \frac{6 \times 5 \times \cancel{4!}}{\cancel{4!}} = 30$

$\frac{8!}{(8-3)!} = \frac{8 \times 7 \times 6 \times \cancel{5!}}{\cancel{5!}} =$

9) Farmer John has 9 cows and wishes to show 3 of them at the State Fair. In how many ways can he choose the 3 cows? (Does order make a difference here?)

$${}_9C_3 = \frac{9!}{(9-3)!3!} = \frac{9 \times 7 \times \cancel{6}}{\cancel{6}} \quad \frac{9 \times 7 \times \cancel{6!}}{\cancel{6!} \cdot 3!} = \frac{9 \times \cancel{8} \times 7}{3 \times 2}$$

10) Farmer John shows 9 cows at the State Fair. The top three ribbons, Blue, Red and Green, go to his cows. In how many ways could his cows receive the three prizes? (Does order make a difference here?)

$${}_9P_3 = \frac{9!}{(9-3)!} = \frac{9 \times 8 \times 7 \times \cancel{6!}}{\cancel{6!}} = 9 \times 8 \times 7.$$

There are 25 students in Miss Smeagle's 3rd Grade class, 12 girls and 13 boys. For the Thanksgiving play, she must choose one to play a Pilgrim, one to play the friendly Indian, and one to play the unfortunate turkey. While she has both boy and girl Indian costumes, she only has a Pilgrim costume for a boy. To make matters more complicated, 1) the principal insists that both genders should be represented in the play and 2) no girl is willing to be the turkey. With these considerations in mind, in how many possible ways can she stage the play?

$13 \cdot 12 \cdot 12$

Turkey. Pilgrim Friendly Indian.