

Name: Key Date: _____

Hansen's Probability & Statistics – Trimester Review Guide

1.) In your own words, explain the difference between a Permutation and a Combination.

↓
Specific order matters

↓ don't care about order

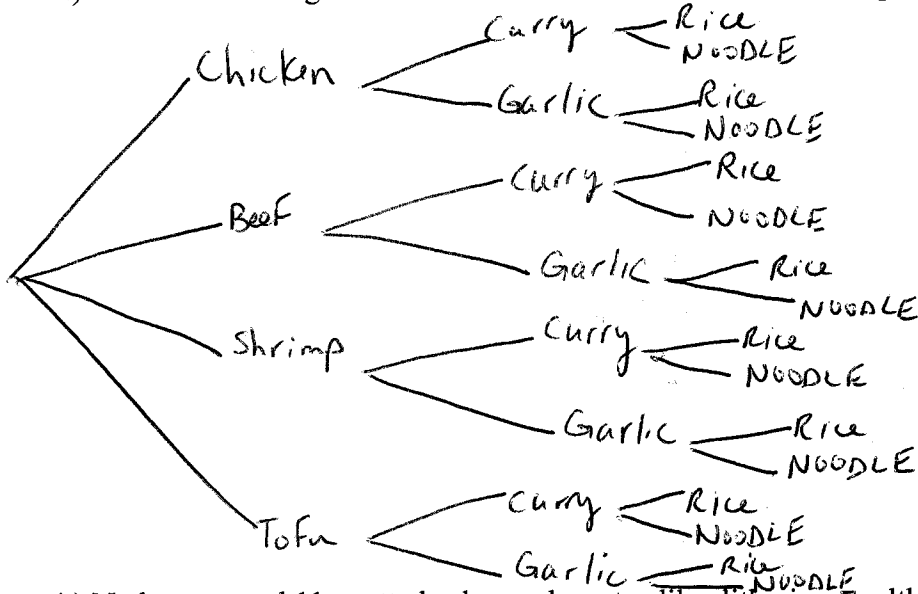
2.) What does 7! really mean?

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

3.) No Thai! Thai Restaurant is featuring a stir fry dinner special, with choice of Chicken, Beef, Shrimp or Tofu for a protein; Curry or Garlic sauce; and Rice or Noodles.

a.) How many different meals can be ordered? Formula: $4 \times 2 \times 2$ Answer: 16

b.) Draw a Tree Diagram below to illustrate the different lunch options:



4.) Nathan spotted 11 spotted salamanders steadily slithering stealthily southward through the swamp. How many combinations of two salamanders could he possibly capture?

Formula: $11C_2$ Answer: 55

5.) Peanut Jo has 13 Wynton Marsalis CDs in her collection and only has time to rip 4 to her iTunes. How many different combinations of CDs could Jonah rip?

Formula: $13C_4$ Answer: 715

6.) Mr. Hansen has 5 pairs of pants, 43 shirts, 19 ties, and 2 pair of shoes. If he wears one of each, how many different outfits can he wear?

Formula: $5 \times 43 \times 19 \times 2$ Answer: 8170

7.) A Civil War reenactment club at the college has 64 members. In how many different ways can the club select actors to play Lincoln, Grant, and Stonewall Jackson?

Formula: $64P_3$ Answer: 249984

8.) Sandman is conducting a sleep survey. From a group of 22 sound sleepers and 35 insomniacs, Sandman wants to randomly select 8 sound sleepers and 8 insomniacs to study. In how many ways can the study group be selected?

Formula: $22C_8 * 35C_8$ Answer: $7.5E12$

9.) Suppose a Quiz Bowl team of 4 is being selected from a pool of 8 men and 12 women. In how many ways can this be done if the rules state that the team must contain *at least 1* woman? 495

Formula: $12C_1 * 8C_3 + 12C_2 * 8C_2 + 12C_3 * 8C_1 + 12C_4 * 8C_0$ Answer: 4775

$1W3m \quad 2W2m \quad 3W1m \quad 4W0m$

10.) A pair of six-sided dice are rolled and you'll keep track of the total (sum) of the two dice.

a) Fill in the 6 by 6 grid showing the different sum totals that you can get when rolling the two dice.

	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

b) What is the probability that you get a total (sum) of 10?

$$\frac{3}{36} = \frac{1}{12}$$

c) What is the probability that you get a total (sum) of at least 10?

$$\frac{6}{36} = \frac{1}{6}$$

11.) Our 3rd hour class consists of 10 Female students and 4 Male students. Mr. Hansen wants to select three students to pass back papers. (yeah, right)

a) In how many ways can Mr. Hansen randomly select these three students?

$$14C_3 = 364$$

b) What is the probability that both students selected are Female?

$$\frac{10C_2 * 4C_1}{364} = \frac{180}{364} = 49\%$$

c) What is the probability that two Male and one Female are selected?

$$\frac{4C_2 * 10C_1}{364} = \frac{60}{364} = 16\%$$

12.) Three cards are drawn from a standard deck, *without* replacement. Find the probability that:

a) all are eights. $\frac{4}{52} * \frac{3}{51} * \frac{2}{50} = \frac{24}{132600} = \frac{1}{5525}$

b) all are red.

$$\frac{26}{52} + \frac{25}{51} + \frac{24}{50} = \frac{15600}{132600} \approx 12\%$$

13.) A single six-sided die is rolled once and a single card is drawn from a standard deck of 52 cards. What is the probability you'll land a king and the ace of spades OR an odd and a diamond?

$$0 + \frac{1}{2} * \frac{13}{52} = \frac{13}{104} \approx 13\%$$

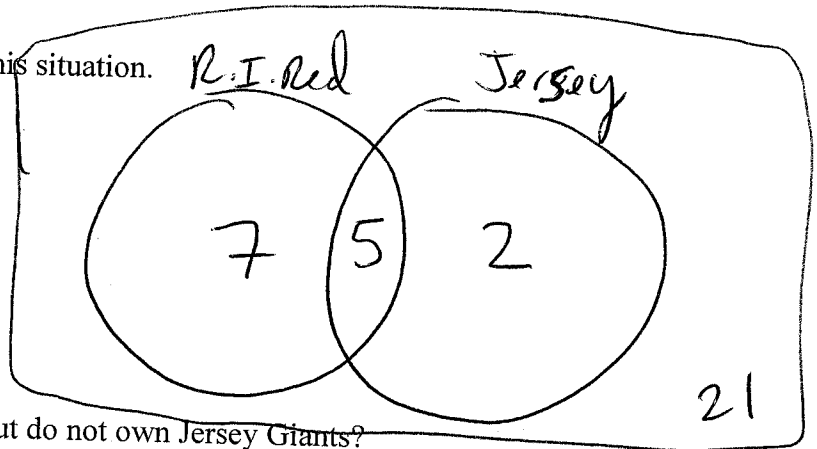
14.) Suppose you roll a die one time. What is the probability of rolling an odd OR greater than 2?

(1), 2, (3), 4, (5), 6

$$\frac{3}{6} + \frac{4}{6} - \frac{2}{6} = \frac{5}{6}$$

15.) There are 35 poultry fanatics at a Hen House convention. Of these fans, 12 own Rhode Island Red Hens, 7 own Jersey Giants. 5 own both breeds!

a) Draw and label a Venn diagram for this situation.



b) How many own Rhode Island Reds but do not own Jersey Giants?

7

c) How many do not own either?

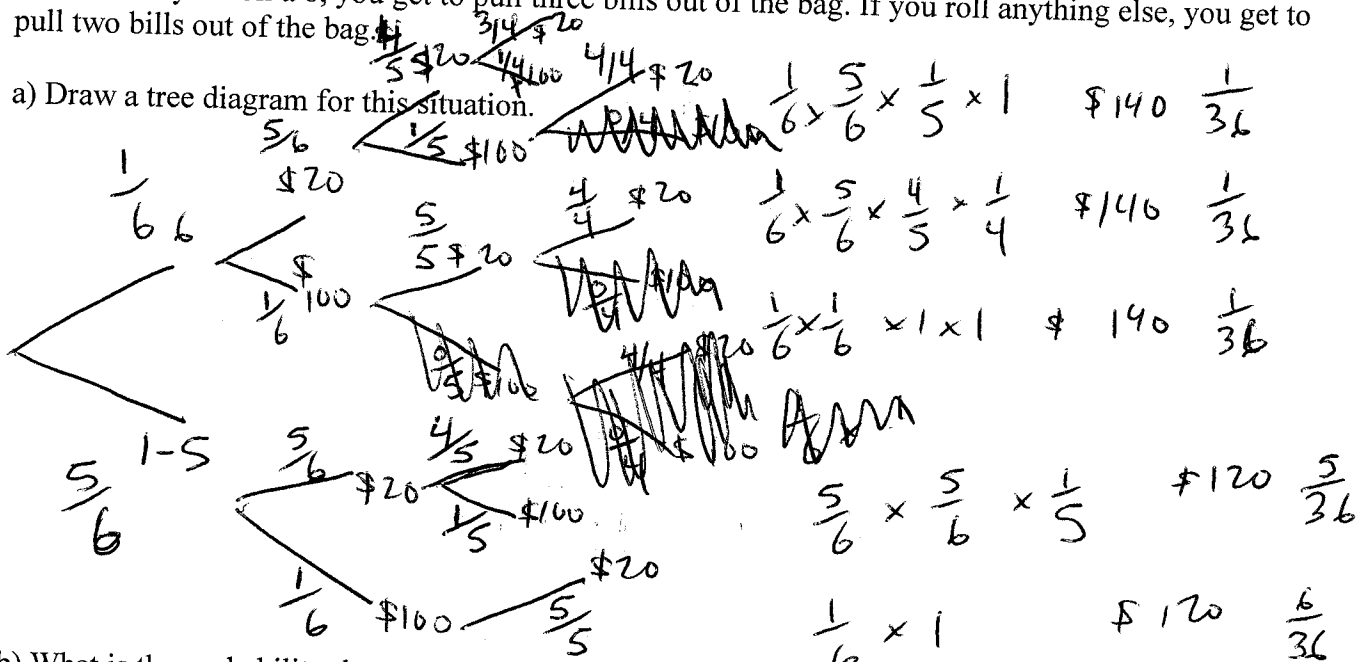
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d) What is the probability a randomly selected Hen aficionado owns a Jersey Giant?

$$\frac{7}{35} = \frac{1}{5} = 20\%$$

16.) For a carnival game, a bag contains one \$100 bill and five \$20 bills. You roll a single six-sided die one time. If you roll a 6, you get to pull three bills out of the bag. If you roll anything else, you get to pull two bills out of the bag.

a) Draw a tree diagram for this situation.



b) What is the probability that you win \$100 or more?

$$\frac{14}{36} \approx 39\%$$

17.) The 2-way table shown below shows the number of different types of automobiles produced by three major manufacturers.

	Ford	Honda	Kia	
Car	8	3	6	17
Truck	5	5	0	10
SUV	4	3	4	11
	17	11	10	38

a.) Fill in the row and column totals for the above table.

b) What is the probability that a randomly selected vehicle is a Kia Truck?

0

c) What is the probability a randomly selected vehicle is a Truck, given that the vehicle is a Honda?

$\frac{5}{11}$

18.) A pair of speakers is on sale for \$1399. The sales tax rate is 6%. What is the total price?

\$ 1482.94

19.) A bicycle shop is selling \$300.00 bikes at 10% off. If the sales tax is 8% how much will the bike cost?

\$ 291.60

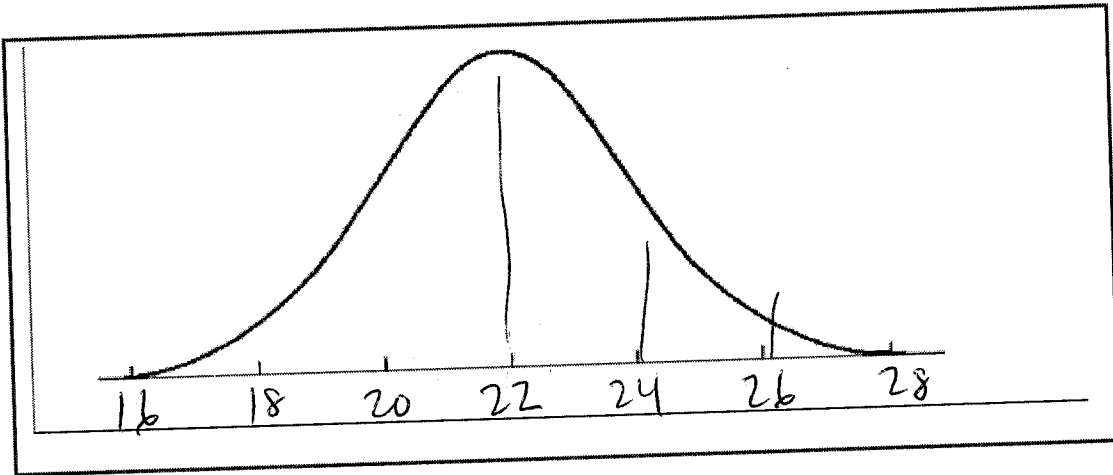
20.) At a restaurant you only have \$50 to spend on dinner. In addition to the cost of the meal you must pay a 6% sales tax and leave an 18% tip. What is the most expensive meal you can afford?

\$ 39.97

21.) Mr. Hansen wants to buy an LCD TV, and he tells the saleswoman he will pay \$750 and THAT IS THAT – out the door, tax included! Assuming 6% sales tax rate, what would the price be before tax?

707.55

Krista makes pottery. The diameters of her bowls are normally distributed. The mean of the diameters is 22cm and the Standard Deviation is 2cm.
 Draw a normal distribution graph. Label the scale and percents.



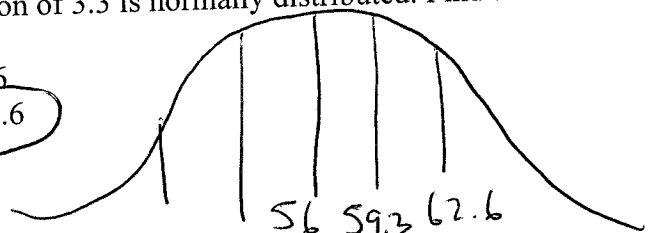
22.) What percent of the bowls have diameters between 20 and 24cm?
 A. 2% B. 13.5% C. 47.5% **D. 68%**

23.) In a typical batch of 40 bowls, about how many would you expect to have a diameter greater than 24 cm?
A. 6 B. 16 C. 13 D. 40 $.16 * 40$

24.) A set of data with a mean of 56 and a standard deviation of 3.3 is normally distributed. Find the values that are 2 standard deviations from the mean.

- a. -6.6 and 62.6
- b. 6.6 and 62.6

- c. -6.6 and 6.6
- d. 49.4 and 62.6**



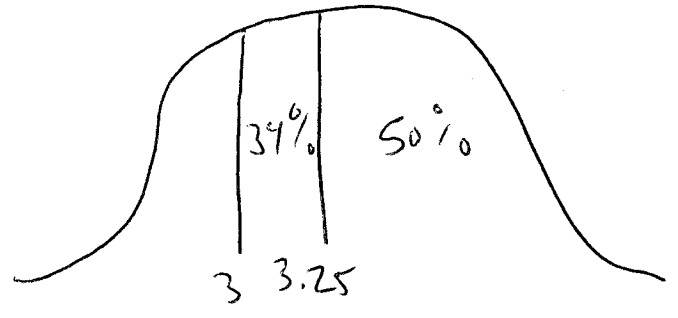
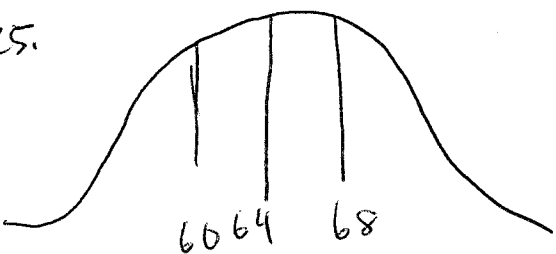
25.) The numbers of cookies in a shipment of bags are normally distributed, with a mean of 64 and a standard deviation of 4. What percent of bags of cookies will contain between 60 and 68 cookies?
 a. 50% b. 13.5% **c. 68%** d. 34%

c. 68%

26.) A grocery store will only accept yellow onions that are at least 3 in. in diameter. A grower has a crop of onions with diameters that are normally distributed, with a mean diameter of 3.25 in. and a standard deviation of 0.25 in. What percent of the onions will be accepted by the grocery store?
 a. 34% b. 97.5% **c. 84%** d. 50%

c. 84%

25.



27.) CRACK the CODE!!!!

Mystery Word

$$\begin{bmatrix} 44 & 20 & 76 \\ 66 & 80 & 111 \\ 43 & 48 & 69 \end{bmatrix}$$

A

Coding Matrix

$$\begin{bmatrix} 1 & 0 & 2 \\ 3 & 4 & 5 \\ 1 & 0 & 1 \end{bmatrix}$$

B

$$A * B^{-1}$$

VEGETABLE

28.) What is your favorite recollection of something ridiculous Mr. Hansen has said this trimester!

Answers may vary 😊