Secondary II-Unit 3.3 Probability Name: Key

Probability Review Date: _____ Period: _____

Use the following information to answer questions #1-10.

$U = \{1,2,3,4,5,6,7,8,9\}$ $A = \{1,3,5,7,9\}$ $B = \{2,4,6,8\}$ $C = \{1,2,4,6,8\}$
$D = \{4\}$ $E = \{3,5,7\}$

1. What is A^c? $\{2,4,6,8\}$

2. What is $A \cap B$? $= \{\emptyset\}$

3. What is $A \cap C$? $= \{1\}$

4. What is $D \cup E$? $= \{4,3,5,7\}$

5. What is $B \cup C$? $= \{2,4,6,8,1\}$

6. What is E^c? $= \{1,2,4,6,8,9\}$

Using the same information above, fill in the blank with the name of a set that makes the statement true (*there could be more than one right answer). Think smaller set of C

7. $D \subset$ B & C

8. E $\subset A$

9. D & B $\subset C$

10. $B \subset$ C

The following table shows data about women on the RMS Titanic. Use the table to answer the following questions.

Women			
	(L) Lost	(S) Saved	**TOTAL**
(FC) 1st Class	4	140	**144**
(SC) 2nd Class	13	80	**93**
(TC) 3rd Class	89	76	**165**
(C) Crew	3	20	**23**
TOTAL	**109**	**316**	**425**

11. $P(S|TC) = \frac{76}{165} = 46.1\%$ Cond

12. $P(TC) = \frac{165}{425} = 38.8\%$ Marg.

13. $P(S|SC) = \frac{80}{93} = 86.0\%$ Cond.

14. $P(FC|L) = \frac{4}{109} = 3.7\%$ Cond

15. $P(SC) = \frac{93}{425} = 21.9\%$ Marg

16. $P(SC|S) = \frac{80}{316} = 25.3\%$ Cond.

17. $P(L) = \frac{109}{425} = 25.6\%$ Marg

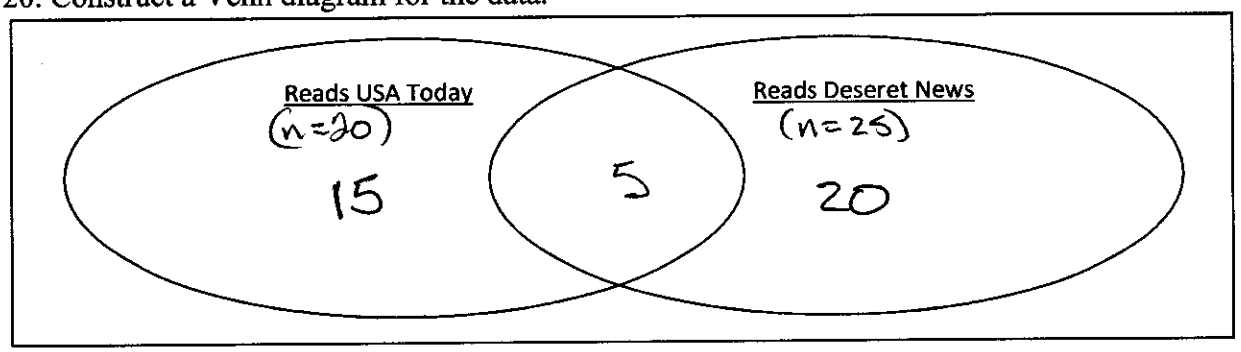
18. $P(L|SC) = \frac{13}{93} = 14.0\%$ Cond

19. $P(L|C) = \frac{3}{23} = 13.0\%$ Cond

Use the two-way table to answer the questions that follow.

	Reads USA Today	Does Not read USA Today	**TOTAL**
Reads Deseret News	5	20	**25**
Does Not read Deseret News	15	60	**75**
TOTAL	**20**	**80**	**100**

20. Construct a Venn diagram for the data.



21. $P(\text{reads Deseret News}) = \frac{25}{100} = 25\%$ Marginal

22. $P(\text{reads USA Today})^c = \left(\frac{20}{100}\right)^c = \frac{80}{100} = 80\%$ Marginal

23. $P(\text{reads USA Today} \cup \text{reads Deseret News}) = \frac{5+15+\cancel{5}+20}{100} = \frac{40}{100} = 40\%$ Joint

24. $P(\text{reads USA Today} \cap \text{reads Deseret News})^c = \left(\frac{5}{100}\right)^c = \frac{95}{100} = 95\%$ Joint

25. $P(\text{does not read USA Today} \cap \text{reads Deseret News}) = \frac{20}{100} = 20\%$ Joint

26. $P(\text{does not read USA Today} \cap \text{does not read Deseret News}) = \frac{60}{100} = 60\%$ Joint

27. $P(\text{reads Deseret News} \cup \text{does not read USA Today}) = \frac{5+20+\cancel{20}+60}{100} = \frac{85}{100} = 85\%$

A researcher collected data from 500 students in order to study the relationship between the amount of sleep a student gets and his/her school performance.. There were 75 students who failed the exam, 50 students that passed the exam with less than 6 hours of sleep, and 408 students with more than 6 hours of sleep.

28. Fill in the table with the given information.

	(P) Passed the Exam	(F) Failed the Exam	**TOTAL**
(L) Less than 6 hours of sleep	50	42	92
(M) More than 6 hours of sleep	375	33	408
TOTAL	425	75	500

29. $P(F) = \frac{75}{500} = 15.0\%$ Marg.

30. $P(F|L) = \frac{42}{92} = 45.7\%$ Cond

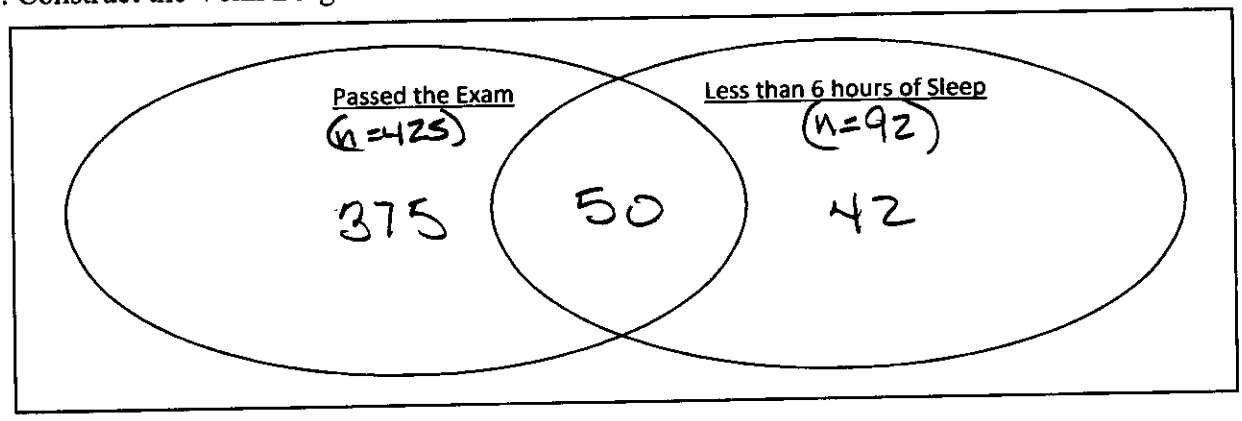
31. $P(L \cap F) = \frac{42}{500} = 8.4\%$ Joint

32. $P(M|P) = \frac{375}{425} = 88.2\%$ Cond

33. $P(M) = \frac{408}{500} = 81.6\%$ Marg.

34. $P(F \cap M) = \frac{33}{500} = 6.6\%$ Joint

35. Construct the Venn Diagram below:



You have a standard deck of 52-cards. Find the following:

36. What is the probability of selecting a red queen?

$P(red \cap queen) = \frac{2}{52} = 3.8\%$

Joint

37. What is the probability of selecting a card that is a club or a 10?

$P(club \cup 10) = \frac{13+4\ (\text{less one club})}{52} = \frac{16}{52} = 30.8\%$

Joint

38. What is the probability of selecting a face card?

$P(face\ card) = \frac{3+3+3+3}{52} = \frac{12}{52} = 23.1\%$

Joint

39. What is the probability of selecting a heart or a king?

$P(heart \cup king) = \frac{13+4\ (\text{less king of hearts})}{52} = \frac{16}{52} = 30.8\%$

40. What is the probability of selecting a black 2?

$P(black \cap 2) = \frac{2\spadesuit \text{ and } 2\clubsuit}{52} = \frac{2}{52} = 3.8\%$

*Bonus: What is the probability of selecting a card that is an ace or a 7 or a king?

$P(card\ is\ an\ ace \cup card\ is\ a\ 7 \cup card\ is\ a\ king) =$