1. List { x | x is an even number greater than 5 and less than 11 } in roster notation.

2. List { Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune } in set-builder notation.

Use these sets for the problems below:

A = { a, b, c, d, e, f, g, h, i, j } B = { a, e, i, o, u } C = { p, q, r, s, t, u, v, w } D = { a, b }

_____3. Find $A \cap B$

_____4. Find $A \cup B$

_____5. Find $B \cap C$

_____6. Find $A \cap C$

_____7. TRUE or FALSE: $g \in A$

_____8. TRUE or FALSE: $B \subset A$

_____9. TRUE or FALSE: $D \subseteq A$

_____10. TRUE or FALSE: $D \subset A$

_____11. TRUE or FALSE: Assuming the universal set is the whole alphabet, $f \in A^C$.

_____12. TRUE or FALSE: Assuming the universal set is the whole alphabet, $A \subset C^C$.

13. List all the possible subsets of { w, x, y, z }

Set A has 9 elements. Set B has 10 elements. $A \cap B$ has 3 elements.

_____14. Find $n(A \cup B)$

Use this information for the following problems: There are 35 students enrolled in a TV class. 20 of the students are women. 10 of the students are enrolled at the Algona center. 6 of the Algona students are women.

_____15. How many students were either women or from Algona.

_____16. How many students were neither women nor enrolled in Algona?

_____17. How many women were enrolled at other sites than Algona?

_____18. A computer comes with a choice of two different processors, four different monitors, six different printers, and two different modems. How many configurations are possible?

_____19. Each question on a multiple choice test has for choices. If there are twelve questions, how many possible ways could you fill out the test?

Would these things involve combinations (C) or permutations (P)?

_____20. Neilsen monitors seventy-two different TV shows and makes up a list of the top ten rated shows for the week.

_____21. The Garrigan student council has 18 members. Mr. Burrow chooses 6 of those students to attend a funeral.

_____22. How many different 13-card bridge hands could be dealt from a standard deck of 52 cards?

_____23. There are 10 teams in the North Central Conference. Many schools have signs in their gyms showing the placing of the various teams. How many different orders could the teams appear in on these signs?

Suppose you roll two standard dice. Find the probability of the following things.

_____24. the sum of the numbers is 9

_____25. you roll "doubles" (the same number on both dice)

_____26. the sum of the numbers is 8

_____27. you either roll doubles or an 8

Use this information for the following problems: Aunt Velma just opened up her freezer and found a bag of cookies she baked last Christmas. The bag has 10 cookies: 1 is shaped like a reindeer, 5 are shaped like stars, 3 are shaped like Christmas trees, and 1 is shaped like a bell.

_____28. If you select a cookie at random, what is the probability you will pick the reindeer?

_____29. If you select a cookie at random, what is the probability you will pick either a star or a Christmas tree?

_____30. Suppose you select a cookie, puts it back because you think it's ugly, and then pick again at random. What is the probability you get the bell both times?

_____31. Suppose you select a cookie, eat it, take another cookie and eat it, and then take a third cookie. What is the probability you will get a Christmas tree the first time, a star the second time, and a reindeer the third time?

It is known that a new drug causes horrible side effects in some patients. 8% of those who take it experience vomiting, 9% experience diarrhea, and 4% experience both.

_____32. What is the probability someone who takes the drug gets either vomiting or diarrhea?

_____33. What is the probability someone who takes the drug has neither side effect?

3500 people entered a raffle. The grand prize is a top-line computer system worth $1,800. The second prize is a home entertainment center worth $1,300. There are two third prizes of $250 cash and 10 fourth prizes of $100 cash. (Assume all 3500 tickets can win each prize.)

_____34. What is the expected value of the raffle?

ANSWERS:

1. { 6, 7, 8, 9, 10 }

2. { x | x is a planet currently said to be in our solar system }

3. { a, e, I }

4. { a, b, c, d, e, f, g, h, i, j, o, u }

5. { u }

6. { } or Ø

7. True (it is one of the things that is in A)

8. False (because there are things in B (o and u) that aren't in A)

9. True (everything in D is also in A)

10. True (everything in D is also in A, and D is smaller than A)

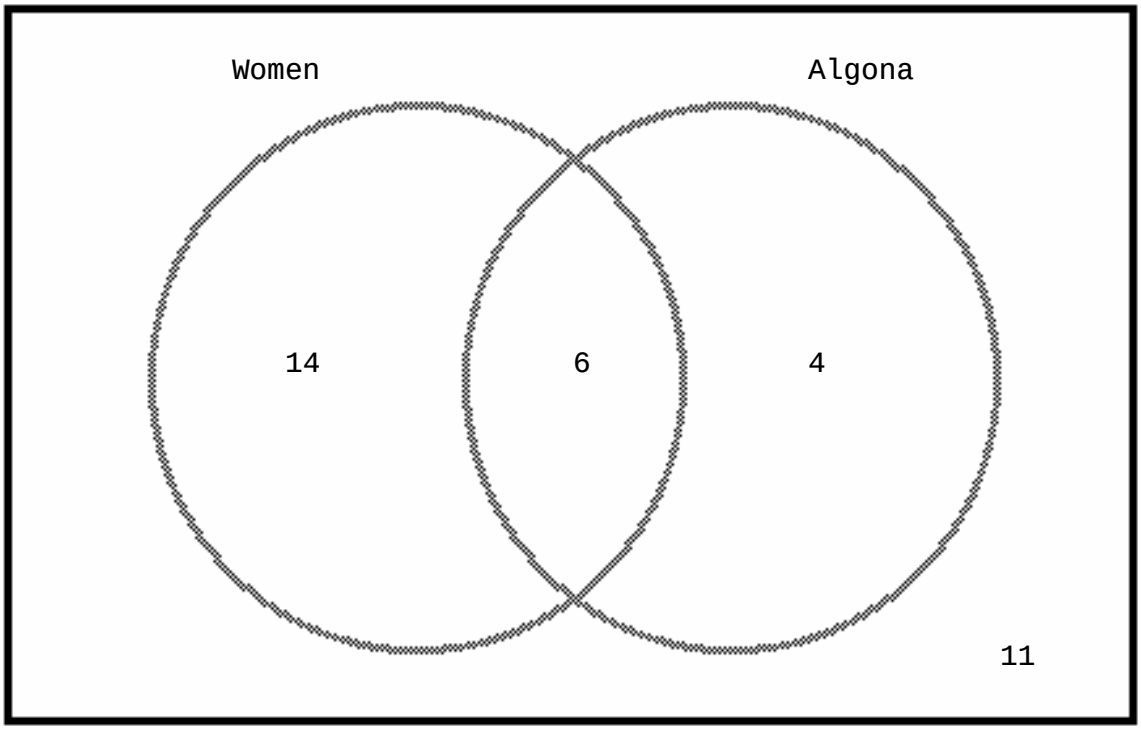
11. False (because f $\in$ A, so it can't be in A^c)

12. True (because nothing in A is in C)

13. { }, { w }, { x }, { y }, { z }, { w, x }, { w, y }, { w, z }, { x, y }, { x, z }, { y, z }, { w, x, y }, { w, x, z }, { w, y, z }, { x, y, z }, { w, x, y, z } … a total of 16 possible subsets

14. 9 + 10 – 3 = 16

15-17. Start with the fact that 6 Algona students are women, the intersection.
Since there are a total of 20 women, there must be 20 – 6 = 14 women not from Algona.
Since there are 10 Algona students, there must be 10 – 6 = 4 Algona men.
This makes a total of 24 people who are either women or from Algona.
Since there are 35 total students, there are 35 – 24 = 11 students who are neither women nor from Algona.



15. 24
16. 11
17, 14
18. 2 * 4 * 6 * 2 = 96
19. 4*4*4*4*4*4*4*4*4*4*4*4 or 4^{12} = 16,777,216
20. permutations (order matters in the top 10)
21. combinations (order doesn’t matter)
22. combinations
23. permutations
24. 5–4, 4–5, 6–3, 3–6 … so $^{4}/_{36}$ or $^{1}/_{9}$ or .11111…
25. 1–1, 2–2, 3–3, 4–4, 5–5, 6–6 … so $^{6}/_{36}$ or $^{1}/_{6}$ or .166666…
26. 2–6, 6–2, 3–5, 5–3, 4–4 … so $^{5}/_{36}$ or .1388888 …
27. $^{6}/_{36}$ + $^{5}/_{36}$ – $^{1}/_{36}$ = $^{10}/_{36}$ or $^{5}/_{18}$ or .277777…
28. $^{1}/_{10}$ or .1
29. $^{8}/_{10}$ or $^{4}/_{5}$ or .8
30. $^{1}/_{10}$ * $^{1}/_{10}$ = $^{1}/_{100}$ or .01
31. $^{3}/_{10}$ * $^{5}/_{9}$ * $^{1}/_{8}$ = $^{15}/_{720}$ or $^{1}/_{48}$ or .020833333…
32. 8 + 9 – 4 = 13%
33. 100 – 13 = 87%
34. 1800*1/3500+1300*1/3500+250*2/3500+100*10/3500 = $1.31