9th Grade Assignment – Week #32

Group Assignment:

For Tuesday

- Together, do as many of the problems as you can from **Possibility & Probability** – **Problem Set #3**.

For Thursday

- Together, do as many of the problems as you can from **Possibility & Probability** – **Problem Set #4**.

Individual Work

- Take the Year-End Test, which is at the end of this document.
- If you have the time and desire, work through the (above) problems that you didn't complete in your group.

Problem Set #3 (Possibility & Probability)

Section A

1) Gail is buying a certain model bike. She has a choice of four different colors, two kinds of handlebars, two kinds of tires, and three different pedals. How many different kinds of bikes are there?

2) How many 5-digit passwords can be created if the first digit must be a 3, the last digit must be odd, and you can't repeat a digit?

3) How many ways can you choose 29 things out of 30 without regard to order?

4) Suppose that a club consists of 8 women and 6 men. In how many ways can a president and a secretary be chosen if…
   a) there are no restrictions?
   b) the president is to be female and the secretary male?
   c) the president is to be male and the secretary female?
   d) both are to be female?
   e) the president and secretary are to be of opposite sex?

5) A class has 7 boys and 10 girls as members. How many different 6-person committees can be selected…
   a) from all the members?
   b) if there must be an equal numbers of boys and girls?

6) There are 6 students in a class. What is the probability that they will arrive to class on a given day in alphabetical order?

7) A box contains 13 cards numbered 1 through 13. Suppose one card is drawn from the box. Find the probability that…
   a) The number drawn is even.
   b) The number is greater than 9 or less than 3.

8) Use Pascal's triangle to expand…
   a) $(x+y)^4$
   b) $(x+2)^4$

9) Four coins are tossed. What is the probability of getting…
   a) all tails?
   b) exactly two heads?
   c) at least two heads?

10) How many ways are there to arrange the letters SSSEEEEPP?

Section B

11) How many different ways are there to arrange 8 identical blue chairs and 6 identical red chairs in a row?

12) Two dice are rolled. Find the probability that...
   a) The sum of the numbers is 10.
   b) The sum of the numbers is 8.
   c) Exactly one die shows a 4.

Problem Set #4 (Possibility & Probability)

Section A

1) In how many different ways can a 10-question multiple-choice test be answered if every question has A, B, C, or D as its options?

2) A committee of 4 is to be selected from a group of 3 seniors, 4 juniors, and 5 sophomores. In how many ways can it be done if
   a) there are no restrictions on the selection?
   b) the committee must have 2 sophomores, 1 junior, and 1 senior?
   c) the committee must have at least 3 sophomores?
   d) the committee must have at least 1 senior?

3) A single marble is drawn from a bag containing 3 red, 5 white, and 4 blue marbles. Find the probability that...
   a) A red marble is drawn.
   b) A red or blue marble is drawn.
   c) A blue or white marble is drawn.
   d) A red, white, or blue marble is drawn.

4) There are 5 multiple-choice questions on an exam, each with 4 possible answers. What is the probability of getting all 5 answers correct, if you guess randomly?

5) What is the probability of randomly, but correctly, guessing the top three finishers in an 8-horse race?

6) Two dice are rolled. What is the probability of getting…
   a) a 7?
   b) an 11?
   c) a 7 or an 11?

7) How many different…
   a) poker hands are possible? (Poker hands consist of 5 cards.)
   b) bridge hands are possible? (Bridge hands consist of 13 cards.)

8) One card is drawn at random from a 52-card deck. Find the probability that...
   a) It is an ace.
   b) It is a diamond.
   c) It is black.

Section B

9) Using the letters of the word "TENNESSEE"…
   a) How many different ways can the letters be arranged?
   b) How many different ways can the letters be arranged so that the 4 E's are in consecutive positions?

10) You and your friend are both in a group of 20 people, and 5 people are to be randomly selected to be on a committee. What is the probability that both you and your friend will be on the committee?

Algebra Year- End Test

Simplify. (2 points each)

1) $4x^5 + 7x^5$

2) $(4x^5)(7x^5)$

3) $(x + 5)^2$

4) $(4x^3)^2$

5) $7x^2(x^2 + 7x - 5)$

6) $5x^3y^2 + 4x^3 - 12x^3y^2$

7) $(2x - 3)(5x + 2)$

8) $(x - 10)(x + 1)(x - 3)$

9) $\frac{3x^{-5}y^2}{6x^3y^{-3}z^{-2}}$

Simplify. (2 points each)

Evaluate each expression (2 points)
given that $x = 3$; $y = -\frac{1}{2}$.

10) $2x^2 - 6y + xy$

Factor. (2 points each)

11) $x^2 + 13x + 30$

12) $x^2 - 13x - 30$

13) $x^2 + 13x - 30$

14) $x^2 - 13x + 30$

15) $x^4 - 25$

16) $x^2 + 9$

17) $x^9 - 4x$

18) $10x^3 + 30x^2 - 40x$

19) $12x^3y^5 - 4x^2y^3$

Find the Common Solution. (4 points)

20) $3x - 4y = 26$
$2x + 5y = -21$

Solve. (4 points each)
Use the quadratic formula only if necessary.

21) $7 + 3(x - 4) = 5x - 4 - x$

22) $3x^2 - 7x = 2x^2 + x + 20$

23) $\frac{3}{x+4} = \frac{5}{3x-7}$

24) $x^2 + 3x = 7$

25) $x^2 + 3x = 10x - 12$

26) $(x+8)(x-3) = 26$