9th Grade Assignment – Week #31

<u>Group Assignment</u>:

For Tuesday

- Together, do as many of the problems as you can from **Possibility & Probability** – **Problem Set #1**.

For Thursday

- Together, do as many of the problems as you can from **Possibility & Probability** – **Problem Set #2**.

<u>Individual Work</u>

- Do **Logarithms** – **Problem Set #5**.
- Prepare for the Year-End Test (which will be part of next week's assignment). Some things to keep in mind:
    - Finish the **Year-End Review Practice** sheets that I gave you last week.
    - Look over old tests from earlier in the year.
    - Note that the Year-End Test will not include these topics:
        - Descriptive Geometry
        - Possibility & Probability
        - Topics that only appeared in the Mid-Year Review unit.
        - The quadratic formula and al-Khwarizmi's work.

Problem Set #5

Calculate each. Use the *Power and Base Tables*, if needed. ** Indicates that answers should be given in scientific notation.

1) 36^2

2) $36^{\frac{1}{2}}$

3) 36^{-2}

4) $36^{-\frac{1}{2}}$

5) $1024^{\frac{1}{5}}$

6) $1024^{-\frac{1}{5}}$

7) **$16,000,000,000,000^2$

8) **$16,000,000,000,000^{\frac{1}{4}}$

9) **$16,000,000,000,000^{\frac{5}{2}}$

10) **$16,000,000,000,000^{-\frac{3}{4}}$

11) $\log_9 729$

12) $\log_9 \left(\frac{1}{729}\right)$

13) $\log_6 1296$

14) $\log_3 \left(\frac{1}{729}\right)$

15) $\log_9 \left(\frac{1}{3}\right)$

16) $\log_3 \left(\frac{1}{9}\right)$

17) $\log_8 16$

18) $\log_{16} 8$

19) $\log_5 (-25)$

20) $\log_{37} \left(\frac{1}{37}\right)$

21) $\log_{25} \left(\frac{1}{125}\right)$

22) $\log_{81} \left(\frac{1}{27}\right)$

Solve. It may help to rewrite the equation in a different form (e.g. exponential or log form). Use a calculator only if necessary.

23) $5^4 = x$

24) $5^X = \frac{1}{125}$

25) $x^4 = 625$

26) $x^3 = 30$

27) $5 \cdot 4^{3x} = 5120$

28) $\log_x 64 = 6$

29) $\log_x 6 = 2$

30) $\log_4 x = 3$

31) $\log_2 32 = x$

32) $\log_5 5x = 3$

33) $4 + 5 \log_3(2x+7) = 24$

34) $\frac{1}{9} 6^{3x-5} - 6 = 18$

35) $8 + 3 \log_5 (2x-7) = 17$

36) A rectangular garden is twice as long as it is wide. By increasing the length and width of the garden by 2 feet each, its area is increased by 40 ft^2. Find the dimensions of the original garden.

-- Possibility & Probability --

Problem Set #1

Section A

1) Bob's Bikes makes bikes with 2 types of frames, 3 handle bar styles, and in colors red, yellow, green, black, or white. How many different bikes can they make?

2) Paul's Pizza offers 3 choices of salad, 20 kinds of pizza, and 4 different desserts. How many different 3-course meals can be ordered?

3) How many 7-digit phone numbers are possible? (The first digit cannot be 0 or 1.)

4) In how many ways can 8 people be lined up in a row?

5) A license plate consists of 3 letters followed by 3 digits (e.g., XBB022). How many different plates could be issued?

6) How many ways can four different roles in a play be assigned from a group of 14 actors?

7) In how many ways can a president and a secretary be chosen from a group of 6 people?

8) In a 6-horse race…
   a) how many different orders of finishing are there?
   b) how many possibilities are there for the first 3 places?

9) A character can be either a letter or a digit. (Thus, there are 36 different characters.)
   a) How many possible three-character codes are there?
   b) How many possible three-character codes have different characters and a digit as the first character?

Section B

10) How many license plates are possible that have 2 digits and 2 letters (in any order)?

11) Using the letters of the word EQUATION, how many
    4-letter words (which don't have to spell anything) can be formed (without repetition)…
    a) that start with T?
    b) that start and end with a consonant?
    c) that have only one vowel?
    d) with all the vowels posi-tioned furthest to the right?

Problem Set #2

Section A

1) Calculate
   (a) $6!$ (b) $_5P_5$ (c) $_5P_3$ (d) $_5P_1$
   (e) $_5C_5$ (f) $_5C_3$ (g) $_5C_1$ (h) $_5C_0$

2) John has 4 ties, 6 shirts, and 3 pairs of pants. How many different outfits can he wear? Assume that he wears one of each kind of article.

3) How many 7-digit telephone numbers can be created if the first digit must be 4, the second must be 7, and the third must be 5 or 6?

4) In how many ways can the letters of the word …
   a) "FRIDAY" be arranged?
   b) "LESSON" be arranged?

5) How many three-digit numbers are there that use only the digits 0,1,2,3,4? (You can't start with 0.)

6) In how many ways can first, second, and third prizes be awarded in a competition in which there are 14 entries?

7) From a group of 14 people, how many ways can a committee of 3 be chosen?

8) There are 13 different colored crayons. How many different ways can you choose four of them?

9) You have a pack of 13 different colored pencils. You wish to color these 4 squares in 4 different colors. In how many different ways can you do it?

10) In how many ways can a committee…
    a) of 3 be selected from a group of 8?
    b) of 5 be selected from a group of 8?

11) One marble is drawn at random from a bag containing 4 white, 5 red, and 6 green marbles. Find the probability that...
    a) it is white.
    b) it is red or green.
    c) it is not white.

12) Three coins are tossed. Find the probability of…
    a) getting all heads.
    b) getting exactly 2 heads.

Section B

13) In a group of 10 people, each person shakes hands with everyone else once. How many handshakes are there?

14) There are 36 numbers on a combination lock. To open the lock you must know the three correct numbers (which are all different) in the correct order. How long would it take a thief to try all possible combinations if it takes 10 seconds to try each possibility?