Tutorial Session Notes
Grade 6
Quarter #4 (Week 25-32)

About these notes:

- These notes are primarily for those who are acting as the tutor – either a parent or a class teacher.
- In the first year of JYMA, Maria (our JYMA tutor) and I met every week and talked about grades 5-8, and we made a list of suggested topics for the Friday tutorial session.
- In order to support those who are acting as the tutor for their child or a whole class, I am sharing these notes with those who are acting as the tutor.
- Of course, these tutorial sessions are also an opportunity for the students to ask their tutor questions.
- If you are acting as the tutor, it may be helpful to read the section of the JYMA Handbook titled "The Role of the Tutor".

Week #25

- Ask if any questions about the work for the week.
- Have them share their solutions for the group assignment problems #2 (areas of shapes) and #3 (prime factorization of nines). if they didn't already do these problems, then work on them now.
- If time, work with division by 7.
  - In the lecture, we did
    $4/7 = 0.5\overline{71428}$
    $52/7 = 7.\overline{428571}$
    $9/14 \quad 0.6\overline{428571}$
  - See if they can figure out the pattern, by calculating these:
    $1/7 \quad 2/7 \quad 3/7$, etc.
- If time, play a game.

Week #26

- Ask if any questions on worksheet #22
- Review division by nines trick. Convert each of the following to a decimal:
  17/99   538/999
- **Most important**: Spend a lot of time talking about the rules for repeating decimals from Thursday's group work. Go over all the problems, and the challenge problems.
  - If needed, then also do the following problems. What would happen with a…
    - denominator of 80?
    - denominator of 22?
    - Denominator of 12?
    - Denominator of 54?
  - Our goal for the next couple of weeks: to be able to look at denominator and predict how many digits will be under repeat bar.
- Go over Thursday puzzle problem
- If time, play a game

Week #27

- Intro to Ratios
  - There are 25 brown basketballs and 15 red basketballs
    - What is the ratio of brown to red? Answer: B:R = 5:3
    - What is the ratio of red to brown? Answer: R:B = 3:5
  - Ratio in a store of apples to oranges is A:O = 4:7
    - What can you tell looking at this ratio?
- Rate problems:
  - If somebody is biking at 18 mph, how far did they go in 3 hours?
  - If somebody is biking at 18 mph, how far did they go in 2 hours and 20 minutes?
  - If somebody is biking at 18 mph, how long does it take to go 36 miles?
  - If somebody is biking at 18 mph, how long does it take to go 84 miles?
  - What is your speed if you take 4 hours to hike 12 miles?
  - What is your speed if it takes 6 hours to go 200 miles?
- Laws of repeating decimals.
  - In the lecture we saw that $\frac{16}{17} = 0.\overline{9411764705882352}$
  - We learned that if a fraction has the max amount of digits under the repeat bar, then the order of the digits will be the same regardless of the numerator. Therefore, you can do the following one fairly easily: $\frac{9}{17}$ (Answer $= 0.\overline{5294117647058823}$)
  - Ask if their group discovered the law: What denominators do not repeat at all?
- If time, go over the Puzzles from the group assignment
  - missing digit multiplication problems
  - coin puzzle

Week #28

- Ask if any questions with problems in the workbook sheet #24:
    - especially #30-32
    - Make sure they understand line graphs #37-#41
- If each fraction were converted into a decimal, state how many digits will repeat under the repeat bar.
    - $\frac{12}{37}$
    - $\frac{58}{101}$
    - $\frac{8}{27}$
    - $\frac{7}{22}$ (note that 22 is 11x2 and we can ignore the 2)
    - $\frac{3872}{4649}$
    - $\frac{239}{405}$ (note the prime factorization of the denominator is 3^4 x 5 - can ignore the 5)
- Convert to a decimal:
    - $\frac{4789}{9999}$
    - $\frac{8}{11}$
    - $\frac{8}{33}$
    - $\frac{6}{37}$
    - *Challenge!* $\frac{127}{2439}$ (hint: do the prime factorization of the denominator)
- Percents:
    - What is 40% of 450?
    - What is 3% of 80?
    - 29 is what percent of 2900?
    - 15,000 is what percent of 24,000?

Week #29

- Start with a game
- Business Math
    - Note: every store that sells things, always has to buy things first.
    - A bicycle store buys and sells 1 kind of bike. They buy bikes for $180/bike, and sell the bikes for $210/bike. How much money do they make if they buy and sell 80 bikes?
- Ask them, how do banks make money? Some possible answers: (1) Borrowing and lending money; (2) Investments; (3) Buying and selling foreign currency (exchanging money)
- Bank Problem:
    - John comes in and gives the bank $3,000 for his savings account, which has 2% annual interest.
      On the same day, Mary comes in and borrows $3,000 at 5% annual interest. One year later, John comes in and collects his money, and Mary comes in and pays back her entire loan.
      1. How much did John get back?
      2. How much did Mary have to pay back?
      3. How much money did the bank make?
- Exchange Rates
    - Norway's currency is the Norwegian Kroner
    - A bank at the airport has rates for buying and selling kroners, as follows:
        - buying: $0.09/kroner
        - selling: $ 0.13 $/kroner
    - The buying and selling rate is from the <u>bank's perspective</u>.
    - Make sure the students understand how the bank makes money doing this.
    - A Norwegian goes to the bank and gives them 1,000 kroners. How many dollars will they get? <u>Important</u>: **The bank is buying kroners**. (Answer: The bank will pay $90 for the 1,000 kroners.)
    - Buying and selling foreign currency is basically the same as buying and selling bicycles.
- If time, go over puzzle problems from this week's group assignments.
    - *Wishful Banking* (From Puzzle Book #96)
    - *Coin Puzzles* (From Puzzle Book #85)
    - *Chinese Remainder Theorem* (answer: 23, 128, 233…)
    - *Number Riddles* (From Puzzle Book #84d)
    - *The Race* (From Puzzle Book #91)

Week #30

- Foreign exchange problems. This will likely take much of the session.
    - Use the same rates from sheet #25:
    - How many US$ do you get if you give 7000 pesos to the bank?
      (Answer: The bank is <u>Buying</u> pesos   7000 x 0.08 → 560 US$)
    - How many pesos do you get If you give 600 US$ to the bank?
      (Answer: The bank is <u>Selling</u> pesos   600 ÷ 0.12 → 5000 MP)
    - How many US$ do you need to give in order to get back 30,000 pesos?
      (Answer: The bank is <u>Selling</u> pesos   30,000 x 0.12 → 3600 US$)
    - How many pesos do you need to give in order to get back 300 USD?
      (Answer: The bank is <u>Buying</u> pesos   300 ÷ 0.08 → 3750 MP)
    - *Challenge!* If somebody gives 20,000 pesos to the bank and gets US$ back, and then (the next day perhaps) give the US$ back to the bank for pesos again, how many pesos do you get back?
      (Answer: Step #1: The bank is <u>buying</u> pesos: 20,000 x 0.08 → 1600 US$
      Step #2: The bank is <u>selling</u> pesos: 1600 ÷ 0.12 → 13,333 MP
      They lost more than 6000 pesos, which is ⅓ of their money!)
- From Sheet #25
    - Ask them to share their line graphs (problem #27).
    - And make sure they understand #26.
- If time, go through puzzles from the group work.
- If extra time, play game.

Week #31

- Go over #33 on **Sheet #26**.
    - Do they understand what it means when the graph is steep, or not steep?
- Do some Compound Fraction practice problems:

$$\frac{8}{4 - \frac{4}{2 - \frac{3}{4}}} \text{ (Answer = 10)} \qquad \frac{\frac{3}{8} + \frac{3}{5}}{\frac{9}{3\frac{3}{4} \cdot 2\frac{2}{3}} \div 3} \text{ (Answer = 3¼)}$$

- A bank in Sao Paulo Brazil (currency is the Real) has these exchange rates:
    - Buy: $4 \frac{\text{Real}}{\text{USD}}$
    - Sell: $5 \frac{\text{Real}}{\text{USD}}$
    - What do these rates mean?
    - Questions:
        - If you give the bank 200 USD, how many real will you get? (ans: 200x4 = 800)
        - If you give the bank 5000 real, how many dollars will you get back? (5000 ÷ 5 = 1000)
- The same bank also has an office in New York. If the rates are equivalent to what they charge to exchange in Sao Paulo, what are the rates going to be for the Real in NY? (Hint: use reciprocals)
  (Ans: Buy: $0.2 \frac{\text{USD}}{\text{Real}}$ and sell: $0.25 \frac{\text{USD}}{\text{Real}}$
- If extra time, give a few percents practice problems, or play a game.

Week #32

- Do something fun! Bring the year to a nice close!