**MPM 1D Handout**
**Unit 1 Review**

**Date:** **Name:**

**What is an integer?**

- An integer is a positive or negative whole number (including zero).
- An integer is NOT a decimal or fraction.

**Operations with Integers:**

- You can use a number line, integer chips, or the idea of profit and loss to make operations easier. Do not become completely dependent on a calculator.
- Always take a minute to think about whether your answer makes sense!
- Refer to your note from class for examples to guide you through this handout.

**What is a Fraction?**

- A fraction represents a part of a whole, and can be written as a decimal (sometimes it's a repeating decimal, sometimes it is a terminating decimal)

**What is a Rational Number?**

- A positive or negative number that can be written as a fraction. Rational numbers include integers, but can also be parts of wholes.

**Operations with Rational Numbers:**

- To add and subtract, you need a common denominator.
- To multiply, you multiply straight across the top and the bottom.
- To divide, flip the second fraction and multiply.

No matter what type of numbers or expressions we are working with, we ALWAYS need to follow the correct order of operations.

**B**rackets – Simplify the stuff inside them as much as you can!
**E**xponents – Apply them to the term that they belong to. Remember that exponents represent repeated multiplication!!
**D**ivision
**M**ultiplication
**A**ddition
**S**ubtraction

**Ratio –** A comparison of two or more quantities measured in the same units

Representations: $\frac{a}{b}$ OR a:b OR a to b

**Rate** – A comparison of two quantities measured in different units (you MUST state the units!)
**Unit Rate** – A rate per single unit (divide the first quantity by the second to express a rate as a unit rate)

Remember that a percent represents a part of 100. We can express percentage values as decimals (divide by 100) and fractions (over 100, reduce to lowest terms) as well.
When you are doing real life problems, make sure that your answers make sense! If they don't, rethink your approach!

For each problem you must write a concluding statement and show your work!!

**Part 1: Order of Operations with Integers and Fractions**

1. Explain to a younger student how to add or subtract integers. Be sure to explain how to predict the sign of your answer.

2. When you combine double signs, what operation are you doing? Show this using the number one. (*What operation is occurring when you write –(-2) as 2?)*

3. Explain to a younger student how to add fractions. Show an example.

4. How do you write a mixed number as an improper fraction? What do you need to be careful about if the whole number is negative? Use an example to support your explanation.

5. Evaluate each of the following. Show where you combine double signs and find a common denominator.

   a. (-5)(-3) – (-6) + (-10)

   b. $\frac{2}{3} - \frac{5}{6} + \left(-\frac{3}{4}\right)$

6. Evaluate. Follow the appropriate order of operations and show your work! Use your calculator to support your thinking and to check your answer.
   a. $(4-8)^3 \div (-16) + (-3-7) + (-10)$

   b. $\frac{(-3)^2(-2)+(-3)(-2)}{(9-7)^3}$

   c. $\frac{(-4)(5)}{(-2)(3-2)} - (-6) - 2^2$

d. $\left(\frac{3}{4}-\frac{5}{8}\right)+\left(\frac{1}{2}\right)^{3}-\frac{11}{12}$

e. $\left(-\frac{5}{6}\right)\div\left(\frac{3}{4}\right)+\left(-\frac{2}{3}\right)-\left(\frac{3}{2}\right)^{2}$

f. $\left(\frac{5}{9}-\frac{4}{3}\right)^{2}-(-4)(-9)\div 12+\frac{11}{18}$

**Part 2: Ratios, Rates and Unit Rates**

1. What is a ratio? Give an example.

2. What is a rate? Give an example.

3. How are ratios and rates similar? How are they different?

4. What is a unit rate? How do we find a unit rate? Give two real life examples of times where a unit rate would be helpful to us.

**Questions 5 & 6 are from previous EQAO tests.**

5. Raisins and sunflower seeds are sold together in packages of 250 g. The ratio of the mass of raisins to the mass of sunflower seeds is 3 to 5. Determine the mass of raisins in the package. Show your work.

6. Three partners, Luc, Deborah, and Melanie, share the profits of a business in the ratio 2:3:7 respectively. The profit for this year is $176 496. Determine the share of the profit for each partner. Show your work.

7. Write each of the following as a rate and then as a unit rate.
    a. $75 for 5 hours of work.

    b. $10.98 for two bottles of shampoo.

    c. 88 km in 4 hours.

8. Freshco is offering sales on two different packages of pasta this week. The first is $1.39 for 500g, and the second is $2.19 for 650g. Determine the price per gram and then the price per 100g, and state which one is the better buy.

**Part 3: Working with Percent**

1. What does a percent value represent?

2. Explain how to make a percent into a decimal, and then how to write it as a fraction. Include an example.

3. Explain how to make a fraction into a decimal, and then how to write it as a percent. Include an example.

4. Complete the following table.

| Fraction | Decimal | Percent |
|---|---|---|
| $\frac{5}{12}$ | | |
| | 0.088 | |
| | | 3.5% |
| | | 110% |
| $\frac{1}{20}$ | | |
| | 0.517 | |

5. Determine 38% of 224. Show your work.

6. Calculate your percentage grade on yesterday's quiz. Show your work and round to one decimal place.

7. Avery wants to buy a pair of boots that are regularly $139.99, but they are on sale for 40% off.
    a. Determine the sale price of the boots.

    b. Calculate the after tax cost for the boots.

    c. If her parents are willing to pay 70% of the total price after tax, how much (in dollars and cents) will Avery have to pay herself?

8. Tyler bought a hockey stick that was on sale for $75. The discount was 30%. What was the original price of the stick? Show your work.

9. Brooklyn and Alma paid $38.65 after they gave a tip, but before tax for lunch at Xaco Taco. What was their bill before the tip if they tipped 17%? Show your work.