Math 8 Schroeder

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 **Chapter 4 – Ratios and Percents**

Test Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

To do:

4.1 – Ratios

* Complete Notes ⃝

4.2 – Equivalent Ratios

* Complete Notes ⃝

4.3 – Rates

* Complete Notes ⃝

4.4 – Percentages

* Complete Notes ⃝
* Quiz 1

4.5 – Problem Solving

* Complete Notes ⃝

4.6 – Percentage Changes ⃝

* Complete Notes

4.7 – Combining Percentages ⃝

* Complete Notes

4.8 – Unusual Percentages ⃝

* Complete Notes
* Quiz 2

Complete Chapter Assignment ⃝

**Write Unit Test ⃝**

Math 8 **Lesson 4.1 - Ratio** Schroeder

A ratio is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of amounts.

There are many ways to compare and express ratios:

* Part-to-part
* Part-to-whole
* Multiple term ratios

**Part-to-part**

Ratios that compare one part to another part:

**Part-to-whole**

Ratios that compare one part to the whole group:

**\*\*Part-to-whole ratios can also be expressed with fractions and percents.**

**Multiple term ratios**

Multiple term ratios will compare more than 2 amounts:

**Practice:**

1. A juice from concentrate instructs that you need to combine 3 cans of water with 1 can of frozen juice. What is the ratio of cans of juice to cans of water?
2. Jenna has a bag full of school supplies. She has 4 pencils, 7 pieces of paper, 1 pen, and 2 erasers.

What is the ratio of erasers to pencils?

What is the ratio of pieces of paper to the total number of items in the bag? Express as a fraction and a percent:

Math 8 **Lesson 4.2 – Equivalent Ratios** Schroeder

Equivalent ratios are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of numbers, written as ratios that are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to each other. Equivalent ratios can be formed by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the terms by the same non-zero number.

**Practice:**

1. Write 3 ratios equivalent to 2 : 6
2. Write a ratio equivalent to $\frac{18}{12}$ in lowest terms
3. A class of 28 students had some blue-eyed students and some brown-eyed students. The ratio of blue-eyed to brown-eyed was 4 : 3. How many blue-eyed students were in the class?

Math 8 **Lesson 4.3 - Rates** Schroeder

Rates are similar to ratios where they compare two different things. Rates compare two different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A unit rate is when you compare to a quantity of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Examples:**

In order to compare rates, you may need to find the unit rate. This can be done by dividing your ratio by a value to make the second term equal to \_\_\_\_\_\_\_\_\_\_\_\_\_.

**Practice**

1. You ride your bike at a speed of 15 km/hr. How far will you go in one minute? Will you make it to your friend’s house which is 5 km away in 10 minutes?
2. Use a conversion factor to solve:

How many weeks in 84 days?

Math 8 **Lesson 4.4 - Percentages** Schroeder

A percent is a value calculated \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, meaning 100% is a whole amount.

For example:



**Percents to Decimals**

Divide the number in front of the % symbol by 100. This will move a decimal two positions left.

$78\%$ $6\%$ $115\%$

**Decimals to Percents**

Multiply the number by 100. This will move a decimal two positions right. Don’t forget to include your % symbol.

$0.43$ $2.57$ $0.03$

**Percents to Fractions**

Make the number in front of the % symbol a numerator with a denominator of 100, then reduce the fraction to lowest terms.

$17\%$ $46.8\%$ $175\%$

**Fractions to Percents**

Divide the numerator by the denominator, then multiply the value by 100. Don’t forget to include a % symbol.

$\frac{5}{6}$ $4\frac{8}{9}$ $\frac{3}{4}$

Math 8 **Lesson 4.5 – Problem Solving** Schroeder

In order to determine and solve a percentage problem, setting up a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ using equivalent ratios works the best.

$$\frac{portion}{total}=\frac{portion}{total}$$

In all cases, an unknown value in the proportion should occur, where the unknown value is in the proportion changes. Hence the approach to solving the proportion changes.

**Examples:**

What number is 37% of 52?

40 is what percent of 75?

25% of what number is 16?

Math 8 **Lesson 4.6 – Percentage Changes** Schroeder

Some problems are looking to either increase or decrease a value by a certain percentage.

When it comes to increasing, you must add\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the percentage given in order to increase the overall total.

For decreasing, you may need to subtract the percentage given from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in order to find the remaining amount after the decrease.

**Examples:**

15% increase of a monthly salary of $5400. What is the new salary?

20% off a jacket from the original price of $135. What is the new price?

Math 8 **Lesson 4.7 – Combining Percentages** Schroeder

When multiple percentages are being applied to a number, it is important to know if both of the percentages are being applied to the original number as in the calculation of PST and GST.

**In some cases, the percentages are applied on an increasing or decreasing amount as in sales or salary increases.**

**Examples:**

1. Andrea wanted to buy a skateboard that was worth $415. She waited until it went on sale at 30% off. Including both the GST and PST, what was her total cost?
2. Andrea saw a skateboard at a different store that was advertising 20% off. A week later she noticed they were offering an additional 10% off the sale price. If the regular price was $415, what is the new price? Which store is the better deal in comparison to example 1?

Math 8 **Lesson 4.8 – Unusual Percentages** Schroeder

There are times when you will see large percentages - those greater than 100% and very small percentages - those less than 1%.

**Examples:**

0.25%

215%