

Year – End Review

Integers – this isn't actually a Math 8 topic. It was used a review from Grade 7 at the beginning of the year. The only thing that you need to know how to do on the final exam with integers in in the next section on Central Tendency.

Central Tendency – Know the difference between, and be able to calculate the mean, median and mode (all ways to describe the “average” number)

- Mean – add up all the numbers then divide by the number of terms (probably what you think of as an “average”).
- Median – the middle number
- Mode – the most common number, the one that is written down the most

Operations with Fractions – add, subtract, multiply divide, and BEDMAS

- To add or subtract, you must have a common denominator. If you don't have one, you will need to create one. Then, ONLY add or subtract the numerators, the denominator does NOT change.
- Always change mixed numbers to improper fractions at the start of a question and change them back from improper fractions to mixed numbers at the end of a question.
- Final answers must be reduced to lowest terms.
- Multiplying is the EASIEST! Top x top, and bottom x bottom.
- We NEVER divide fractions. Always change the question to “multiply by the reciprocal”.

Proportional Reasoning – Rates, ratios, and proportions. Best buys.

- Ratio – comparison of two or three terms with the same “units”.
 - 2 m to 5 m 2 m : 5 m 2 m / 5 m
 - Reduce to lowest terms (like fractions)
- Rate – comparison of two number with different unit
 - 30 km in 45 min
 - Money is always on the top
 - Time is always on the bottom
- UNIT RATE – a rate where the second term equals 1
- UNIT PRICE – the cost of 1 item

- Best buy – to determine a best buy, calculate the unit price for both options and compare. The lower unit price is the best (or better) buy.
- Proportions- setting two ratios or rates equal to each other with an unknown...
 - Identify an “multiplier” to solve or
 - Use the cross multiply and divide strategy
 - For example: $\frac{11}{16} = \frac{?}{40}$ Solution: $11 \times 40 \div 16 = 27.5$

Percents – working with percents less than one and greater than 100, calculating taxes, discounts and sales

- Know what a fractional percent looks like on a hundred grid
- Percent means per 100
- Conversions between fractions, decimals and percent
 - Proportions almost always work
 - There are many “short-cuts” to use too
- Percent of a number
 - Can change the percent to a decimal and multiply
 - Set up a proportion, then cross multiply and divide
- Taxes – find the percent of a number, then ADD to the original amount
- Sales – find the percent of the original price (DISCOUNT), then SUBTRACT from the original price to get the sale price

Expressions – translating words into expressions and evaluating using substitution

- Translating - Know some of the words that represent the basic operations
 - A term is always written with the number (coefficient) first and the letter (variable) second. Ex. $2a$ not a^2
- Evaluating – substitute the given values in for the variables and simplify

Two-Step Equations – solving using opposite operations, use reverse BEDMAS, know what the distributive law is.

- You are “undoing” an equation, so you have to follow reverse BEDMAS → add or subtract first, then multiply or divide second
- You must do the SAME thing to BOTH sides of an equation
- Circle the final answer
- Perform a CHECK – substitute your answer back into the original equation and prove that left side = right side
- The distributive law: $5(x+6)$ The 5 is multiplying everything in the brackets.

Discrete Linear Relations

- Three ways to display a linear relation – equation, table, graph
- Linear means the graph will be a straight line, and the table of values will have a constant change for x-values and y-values.
- You should be able to graph data, read points off a graph, create a table of values given an equation, and write an equation given a pattern (in a table or not)

Square and Cube Roots

- Recognize perfect squares and perfect cubes – what makes these numbers special?
- Understand what it means to square/cube a number and how to write this
- Connect squares and square roots to area and side lengths
- Connect cubes and cube roots to volume and side lengths
- Estimate the square root of a number without using a calculator

Pythagorean Theorem - $a^2 + b^2 = c^2$

- Only for a right angle triangle
- Side c is the longest side = hypotenuse
- Sides a and b are the short and medium sides and can be interchanged = legs
- Always LABEL your triangle, then decide what version of the formula you need to use (addition or subtraction)
- If you have a word problem, start by making a sketch.

Surface Area and Volume – All formulas will be provided

- Three views of objects – front, top, side
- Nets – to “unfold” a 3D object
- SA – the SUM of the areas of all the sides
- Volume – how much space an object takes up, or the capacity of a container

Theoretical Probability – (easy cases) two independent events

- Probability of coin flips, rolling a die, spinning a spinner, etc.
- The probability that 2 independent events occur at the same time can be calculated by multiplying their individual probabilities together