Grade 8 Advanced
Study Guide
Math Mid-Year Exam

Date: Sunday, December 10th, 2023.
Time: 8:00 to 9:30.
Duration: 1 hour and 30 minutes.
Study from: Math Reveal Textbook, Math notebook, IXL, ALEKS.

Lesson	Topic	Pages
2-1	Writing and Interpreting Equations	65 – 74
2-4	Solving Equations with the Variable on Each Side	91 – 100
2-5	Solving Equations Involving Absolute Value	101 – 108
2-6	Solving Proportions	109 – 116
2-7	Using Formulas	117 – 128
3-2	Functions	147 – 156
3-3	Linearity and Continuity of Graphs	157 – 166
3-4	Intercepts of Graphs	167 – 178
4-1	Graphing Linear Functions	209 – 218
4-2	Rate of Change and Slope	219 – 228
4-3	Slope-Intercept Form	229 – 238
4-5	Arithmetic Sequences	251 – 258
Types of Questions to expect: Multiple choice, calculations, and word problems.		

Formulas: (To memorize)

Rate of Change $rate\ of\ change = \frac{change\ in\ y}{change\ in\ x}$
The **slope** *m* through any two points (x_1, y_1) and (x_2, y_2) can be found as follows. $m = \frac{y2 - y1}{x2 - x1}$
The **Slope-Intercept formula** $y = mx + b$, where m is the slope, and b is the y-intercept.
To find **any member of an arithmetic sequence** we use the following formula: $a_n = a_1 + (n-1)d,$

where a_1 is the first member and d is the common difference.
Example: If we need to find the 13th member that means that $n = 13$.

Keywords: (To be understood, not memorized)

A **domain** is a set of all possible input numbers.

A **range** is a set of all possible output numbers.

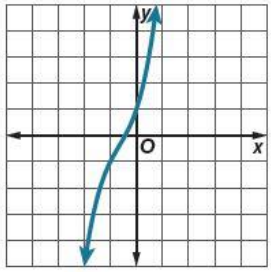
An **ordered pair** is a pair of numbers where the first number comes from the domain and the second number comes from the range.

A **relation** is a set of ordered pairs.

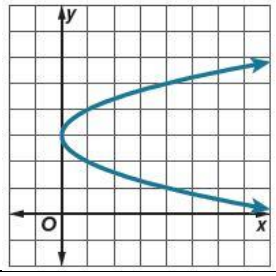
A **function** is a relationship between two set of numbers, where each input has exactly one output.

Vertical Line Test

A relation **is a function** if it passes the vertical line test, meaning a vertical line intersects the graph no more than once.

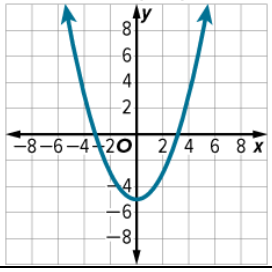


A relation **is not a function** if it fails the vertical line test, meaning that a vertical line intersects the graph more than once.

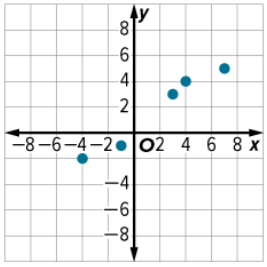


A **linear function** is a function whose graph is a straight line.

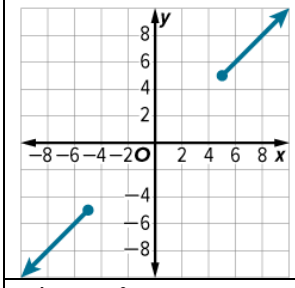
A **continuous function** has a graph that can be drawn without lifting the pen from the paper.



A **discrete function** has a graph that consists of individual points.



A function that is **neither continuous nor discrete** has a graph that combines elements of both.



The **x-intercept** is the point where the graph crosses the x-axis.

The **y-intercept** is the point where the graph crosses the y-axis.

A function is **positive** when its graph lies above the x-axis.

A function is **negative** when its graph lies below the x-axis.

The **rate of change** is how much one thing changes when another thing changes.

The **slope of a nonvertical line** is how much it goes up for every unit it goes to the right.

A **sequence** is a list of numbers that are ordered in a specific way.

An **arithmetic sequence** is a list of numbers where each number is the previous number plus the same number (constant value).
This constant value is called the **common difference**.
For example, the arithmetic sequence 2, 5, 8, 11, 14 has a common difference of 3.

Kindly note that calculators are NOT allowed to be used and smart watches should NOT be worn during an exam.