

This review sheet is intended to cover everything that could be on the exam; however, it is possible that I will have accidentally left something off. You are still responsible for everything in the chapters covered except anything that I explicitly say you are not responsible for. Therefore, if I left something off of this sheet, it can still be on the exam. There will be no multiple-choice questions. Most of the questions will be like the ones in the homework assignments, and possibly a few definition questions, but I am more likely to ask questions that make you use the definitions rather than recite them. I will probably ask one of the questions from the book at the end of the chapters.

The review session will be at a time to be determined in class, probably Sunday 9/13.

Chapter 1.1: Understand the three ways to describe a set, **verbal method**, **roster method**, and the **set-builder method**. *The first one is just sentences. The second one lists all **elements** inside $\{ \}$. The third method $\{x|...\}$ where the $|$ means “such that” or “given that”.* Know the definitions of **natural numbers \mathbb{N}** , **whole numbers \mathbb{W}** , **integers \mathbb{Z}** , **rational numbers \mathbb{Q}** , **real numbers \mathbb{R}** , and **irrational numbers \mathbb{P}** . We will discuss complex numbers later, so do not worry about them for now. Be able to take a set and write it in **interval notation** and plot it on a **real number line**. *If it is $<$ or $>$ then use a parenthesis like $($ or $)$ respectively and make your point on the number line an open circle. If it is \leq or \geq then use a brace like $[$ or $]$ respectively and make your points on the line solid circles.* Understand how to find **intersections \cap** and **unions \cup** . *Union looks like a U and includes elements in one set or the other set. The United states started as a union of 13 colonies. Intersections is the other one and only includes elements in one set and the other set. When standing in an intersection, you are standing on both streets.* Know the **Cartesian Plane**. Know which is the **X-axis** and which is the **Y-axis**. The **ordered pair** is (x, y) and is in alphabetical order. Know what the pairs look like when on the X-axis, Y-axis, and the **origin**. Know the **quadrants**. *I is where you want to be, both X and Y are positive. They then go counter clockwise to II, III, and IV.* **X-axis symmetry** is where two points have the same X value but the Y values are the negative of each other. **Y-axis symmetry** is where two points have the same Y value but the X values are the negative of each other. **Symmetry about the origin** is where both the X and Y values are the negative of the other point. *Page 9 has a helpful graph.* Finding **reflections** is the same as the respective symmetry. Know **distance formula** given below and how to find the **midpoint**. The latter is easy, it is just the average.

$$\text{distance} = \sqrt{(X_2 - X_1)^2 + (Y_2 - Y_1)^2} \quad \text{midpoint} = \left(\frac{X_1 + X_2}{2}, \frac{Y_1 + Y_2}{2} \right)$$

Be able to do a problem like the one on Page 12. *It is easier than it appears. Take the distance formula, replace x with its value (as in the example) or replace y with its value (if you are to find the points a certain distance from a horizontal line), and solve for the remaining variable. Remember to do the \pm when you take the square root.*

Chapter 1.2: Know what a **relation** is. *Note that on the graph on Page 23, the dotted line is because $Y > 1$ and the solid line is because $Y \leq 3$. If there is no “or =” then do not draw it as a solid line.* **The Fundamental Graphing Principle** is that you plot all points which fit the description and no other points. **The X-intercept** is where the graph crosses the X-axis $(X, 0)$ and the **Y-intercept** is where the graph crosses the Y-axis $(0, Y)$. To test X-axis symmetry,

replace Y in your equation with $-Y$. If it simplifies to the original equation then great. For example, $X=Y^2$ becomes $X=(-Y)^2$ which simplifies to $X = Y^2$. Similarly, you test Y -axis symmetry by replacing X with $-X$ and seeing if it simplifies to what you started with. For origin symmetry, replace X with $-X$ and Y with $-Y$.

Chapter 1.3: Know what a **function** is. Basically, it is a relation where for every X , there is only one Y . Doing the **vertical line test** will enable to verify if it is a function or not. Page 44, the graphs for S , S_1 , and S_2 should help with that. Know that the **domain** is all values of X which you can put into the function, and the **range** is all of the values for Y which can result.

Chapter 1.4: Note that a function is a relation which take elements of the domain and puts them in the range. It is written as **$f(X)$** . Finding the value of the function at point X is done by putting the value for X into the function. An **applied domain** is the values that the X can take from an application point of view. For example, as the book points out, when purchasing grapes, you cannot buy a negative amount and you are probably restricted to buying less than 100. So the cost $C(G) = 2 * G$ (when the price of grapes is $\$2/\text{lb}$) would have an applied domain of $0 \leq G \leq 100$ even though there is no mathematical restrictions on the value of G . Understand **piecewise functions**.

Non-graded Homework Assignment #8A to be reviewed with Assignment #8.

Page 52, #34, 36, 40, 44, 49

Page 63, #7, 8

Page 64, #13 & 14 for $f(3)$, $f(X-4)$, and $f(X^2)$ only, not the rest of the functions.

Page 64, #35

Page 65, #50, 54, 58, 60