

The following is a list of topics that you should know to be prepared for Exam 1. A couple example problems are given, but make sure you understand the whole topic and could do any problem you may come across rather than the specific problems given here. Don't forget that your WrittenHW, WebHW, in-class worksheets, quizzes, and exams used in past 115 courses are all available to you!

## 1 Fractions

- Simplifying (§A.3 #7)
  - using factoring (§A.3 #9)
  - fractions with fractions inside
- Adding & Subtracting (§A.3 #29)
  - using the least common multiple (§A.3 #21)
- Multiplying & Dividing (§A.3 #19)
- Dimensional Analysis (§2.6 #31)

## 2 Language & Notation

- Translate “varies directly” and “varies inversely” (§2.6 #19)
  - from English into mathematical symbols (§2.6 #21)
  - from mathematical symbols into English (§2.6 #7)
- write down formulas for word problems (§2.6 #39)
- use function notation
  - find  $f(2)$  given an algebraic rule, table, or graph (§1.6 #9)
  - find  $f + g$ ,  $f - g$ ,  $f \cdot g$ , or  $\frac{f}{g}$  given algebraic rules for  $f$  and  $g$  (§1.6 #17)
  - find  $(f + g)(2)$ ,  $(f - g)(2)$ ,  $(f \cdot g)(2)$ , or  $(\frac{f}{g})(2)$  given graphs of  $f$  and  $g$
  - find  $f \circ g$  given algebraic rules for  $f$  and  $g$  (§1.6 #27)
  - find  $(f \circ g)(2)$  given the graphs of  $f$  and  $g$
- solve word problems with ratios (§2.6 #33), lines (§1.1 #81, §1.2 #87, §1.6 #67), or quadratics (§2.1 #83, 85)

### 3 Functions

- recognize rules that are functions and those that are not algebraically and graphically (§1.1 #31, §1.3 #9, 23,53)
- use the domain convention to find implicit domains (§1.6 #39)
  - solving inequalities (§1.3 #43)
  - solving equations (§1.3 #45)
- graph by plotting points (§1.1 #39, §1.3 #95)

### 4 Graphing

- identify points on the coordinate axes (§1.3 #61)
- plot points given a function (§1.3 #55)
- perform graph transformations (§1.3 #81)
  - vertical and horizontal shifts (§1.5 #11)
  - vertical stretches (§1.5 #31)
  - ordering of the transformations (§1.5 #51)
- use graph transformations to find the rule of a function

### 5 Lines

- identify slope,  $y$ -intercept, and  $x$ -intercept algebraically & graphically
- write the rule given the graph
- draw the graph given the rule
- given conditions, find the rule for the line (§1.2 #27,41)
  - how slopes of parallel lines compare (§1.2 45)
  - how slopes of perpendicular lines compare (§1.2 #67)
- slope-intercept form or point-slope form

## 6 Quadratics

- identify the vertex or the extreme
  - given the graph
  - given vertex form
  - given the form  $ax^2 + bx + c = f(x)$  by completing the square (§2.1 #49)
- given the graph, write the rule (§2.1 #33)
- draw the graph given the rule (§2.1 #39)
- find the  $x$ -intercepts
  - using vertex form (perhaps with completing the square)
  - using factoring
  - using the quadratic formula

## 7 Complex Numbers

- plot points
- add & subtract
- multiply
- divide