

Exam I Study Aid

Exam I : Sections 1.1-1.4
Friday, February 3rd (In Class)

Our first in-class exam will cover all of the material we have discussed so far in class. You will have the entire class period (50 minutes) to complete the exam (you may leave once you are finished). The exam is comprised of 13 questions (some have multiple parts), 9 of the 13 are free-response questions and the remaining 4 are multiple choice or true/false questions.

Below is a list of the main concepts or definitions you should definitely know and be comfortable with. (Note: this list is not a comprehensive list of all the topics we have learned in Sections 1.1 through 1.4, it is simply a list of the very important topics. Hence, as a warning, there may be topics on the exam which are not listed below – i.e. don't simply study this list and nothing else!)

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| 1. Definition of a function | 9. Interval Notation |
| 2. Domain/Range of a function given an equation/graph/table | 10. Increasing/Decreasing/Constant intervals of a function |
| 3. Zeros of a function | 11. Turning Points |
| 4. Evaluating a function (at a number or algebraic expression) | 12. Even/Odd Functions |
| 5. Piecewise Functions | 13. Approximating Zeros / Turning Points / Minimum / Maximum using a Graphing Calculator |
| 6. Dependent and Independent variables | 14. How to construct Mathematical Models for application problems |
| 7. Vertical Line Test | 15. Cost/Revenue/Profit Functions |
| 8. Determining x - and y -intercepts | |

Finally, here is a list of good practice problems that might help you in studying. All of the problems were picked to be odd numbered so that their solutions would be found in the back of the book. I have provided solutions to the supplemental problems which are not found in the book at the bottom of this page.

- Section 1.1 – 3, 7, 9, 13, 25, 27, 31, 35
- Section 1.2 – 1, 3, 5, 7, 9, 13, 15, 17, 21, 27, 29, 35
- Section 1.3 – 19, 29, 31, 37
- Section 1.4 – 1, 3, 7, 15, 23, 25

Supplemental Problems:

1. Which of the following equations determine y as a function of x ?

$$(1) x^2 + y^2 = 4 \quad (2) x + y = 3 \quad (3) \frac{2}{3}x^3 + y^3 = 16 \quad (4) -x + y^4 = 6$$

2. A cellphone service provider offers the following data plan for smartphones: \$20 per month for the first 4GB of data usage, then \$8 per gigabyte for each gigabyte **over 4GB**. Construct a model for the monthly cost under this data plan in terms of the number of gigabytes used, x . (Assume that **over 4GB of data is always used!**)

Solutions to Supplemental Problems: 1. (2) and (3) only 2. $C(x) = 20 + 8(x - 4)$