

Review for Exam I

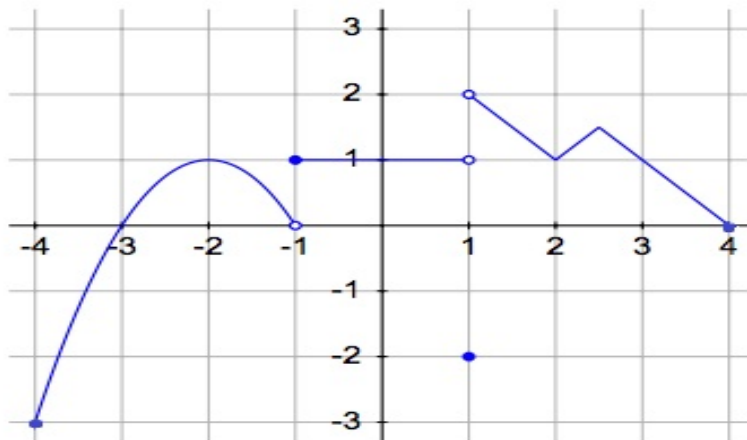
MATH 1113 sections 51 & 52 Fall 2018

Sections Covered: 1.3, 1.4, 1.2, 2.2, 2.3, 2.1, 2.5

Calculator Policy: There will be NO calculator use on this exam. You are strongly encouraged to prepare for the exam without relying on a calculator.

This review is provided as a courtesy to give some idea of what material is covered. Nothing else is intended or implied.

(1) Use the graph of $y = f(x)$ shown to answer the following questions.



1. Evaluate $f(-1)$
2. On which intervals is f increasing?
3. Evaluate $f(1)$
4. Find all solutions of the equation $f(x) = 0$.
5. How many solutions are there to the equation $f(x) = \frac{1}{2}$?
6. Identify an interval over which f is constant.
7. Evaluate $f(f(-3))$. How about $f(f(f(-3)))$?

(2) Find the domain of each function. Express the answer using interval notation.

(a) $f(x) = \frac{1}{x^2 - 4}$

(b) $H(t) = \sqrt{1 - |t|}$

(c) $g(v) = \frac{1}{v^2 + 3}$

(3) Let $f(x) = 2x^2 - 3x$. Evaluate each of the following.

1. $f(2)$

2. $f(-2)$

3. $f(r)$

4. $f(4r)$

5. $f(x + h)$

6. $f(x + h) - f(x)$

7. $\frac{f(x + h) - f(x)}{h}$

(4) Consider the functions

$$f(x) = \sqrt{x^2 + 1}, \quad g(x) = \frac{1}{x - 1}, \quad \text{and} \quad h(x) = 3x^2$$

Evaluate each expression. Simplify if possible.

1. $(f + g)(0)$

2. $\left(\frac{h}{f}\right)(1)$

3. $(hg)(2)$

4. $(f \circ g)(0)$

5. $(g \circ f)(0)$

6. $(h \circ f)(2)$

7. $(f \circ f)(1)$

8. $(f \circ g)(x)$

9. $(h \circ g)(x)$

(5) A company wants to manufacture widgets. There is a one time expense of \$3000 for the manufacturing equipment, and it costs \$10 in material and labor to produce each widget.

(a) Write a linear function $C(x)$ representing the cost in dollars associated with producing x widgets.

(b) What is the cost to produce 250 widgets?

(c) Suppose the widgets will sell for \$17.50 each. How many widgets have to be sold to break even? (*Break even* means expenses equal revenue.)

(6) Consider the two lines L_1 and L_2 given below.

$$L_1 \quad 2x - y = 3 \quad \text{and} \quad L_2 \quad 16x + 4y = 1$$

1. Write L_1 and L_2 in slope intercept form.

2. Determine if L_1 and L_2 are parallel, perpendicular, or neither.

3. Find a line parallel to L_1 that passes through the point $(3, 7)$.

4. Find a line perpendicular to L_2 that passes through the origin.

5. Find all numbers k such that the line through $(1, k)$ and $(0, 4)$ is parallel to L_1 .

6. Find all numbers k such that the line through the points $(1, k)$ and $(k, 2)$ is perpendicular to L_2 .

(7) Use transformations to produce a rough plot of each of the following. Label key points (such as intercepts)

(a) $y = \sqrt{x - 2}$

(b) $y = \sqrt{x} - 2$

(c) $y = (x + 3)^3 + 1$

(d) $y = -\sqrt{x + 2}$

