

Exam #1
Math 119
February 20, 2004

Name _____

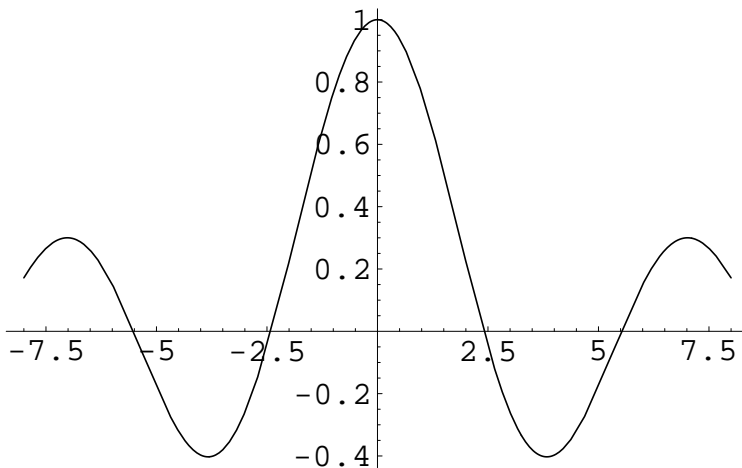
All questions are worth an equal number of points. All work is to be done on the blank paper provided. At the end of the exam, please hand in this sheet, together with all of your work.

§1 Calculation

1. Below is the graph of a function $y = f(x)$. Plot the graphs of

- a. $y = 2f(x)$,
- b. $y = f(x) + 2$, and
- c. $y = f(x + 2)$.

On each graph carefully indicate the function, the axes, and the scale.

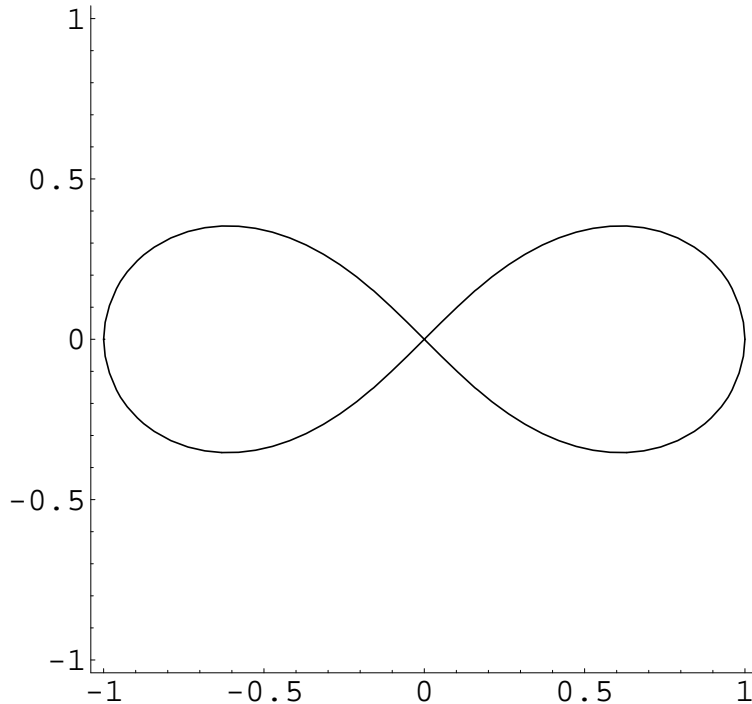


- 2. Write an equation of the line whose x -intercept is 4 and whose y -intercept is -3 . Is the resulting linear function increasing or decreasing? Why?
- 3. Write an equation of the line through $(-1, 3)$ parallel to $2x + 3y = 1$.
- 4. Solve the following inequalities analytically.
 - a. $|2x + 7| < 5$
 - b. $3 - 5x \leq 2 < 1 + x$

5. Sketch a graph of the function $f(x) = \begin{cases} x - 2, & x \leq -1 \\ 3x, & -1 < x \leq 2 \\ 5 - x, & x > 2 \end{cases}$

§2 Comprehension

6. What is the definition of a function? Explain the importance of domain and range.
7. What is the slope-intercept form of a line? What is the point-slope form of a line? In each case, explain the meaning of each symbol that appears.
8. Is the following the graph of a function? Why or why not?



§3 Application

9. A company finds that it can produce 10 heaters for \$7500, while producing 20 heaters costs \$13,900.
 - a. Express the cost as a function of the number of heaters. Assume a linear relationship exists between the number of heaters and the cost of producing the heaters.
 - b. What is the cost of producing 25 heaters?
10. An appliance salesperson receives a base salary of \$200 a week, and a commission of 4% on all sales over \$3,000 during the week. In addition, if the weekly sales are over \$8,000, the salesperson receives a \$100 bonus.
 - a. Write a function that describes the amount of money that the salesperson earns as a function of sales.
 - b. Sketch the graph of the function.
 - c. Identify any points of discontinuity.
 - d. How much money does the salesperson make on sales of \$5,570? On sales of \$9,200?