

MATH 120
Exam 1 - Version 1
October 24, 2001

Name _____

Section _____

1	8	
2	8	
3	8	
4	8	
5	8	
6	10	
Total	50	

- You are allowed to use a scientific calculator with no graphing capabilities.
- Complete all questions.
- Show all your work.
- You have 50 minutes to complete the exam.

GOOD LUCK!

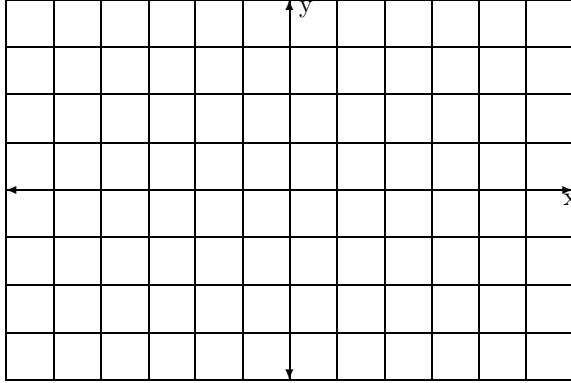
1. (8 points) Find the equation of the circle with center $(-3, -8)$ and area 36π .

2. (8 points) Find a number k so that the line through the points $(-3, k)$ and $(4, 8)$ is parallel to the line through the points $(6, 4)$ and $(2, -5)$.

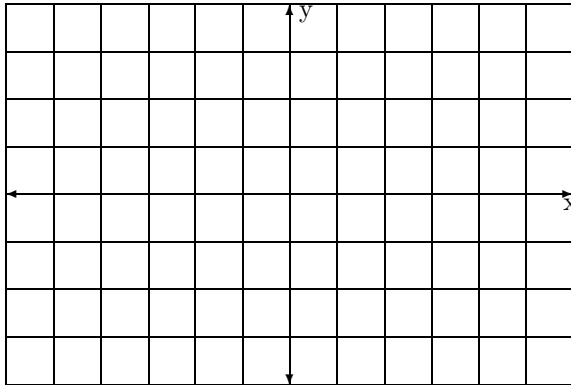
3. (8 points) Let

$$f(x) = \begin{cases} -\frac{1}{3}x, & \text{if } -3 \leq x \leq 0 \\ x, & \text{if } 0 \leq x \leq 1 \\ 1, & \text{if } 1 \leq x \leq 3 \end{cases}$$

(a) Draw the graph of $f(x)$ and state the domain and range.



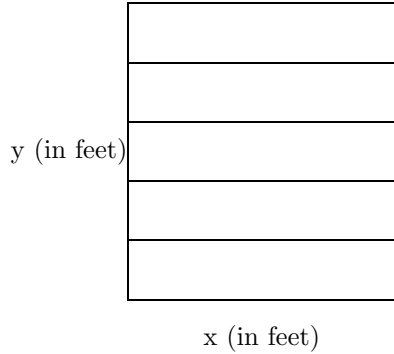
(b) Draw the graph of $h(x) = -2f(x + 1)$ and state the domain and range.



4. (8 points) Suppose $f(x)$ is a linear function. Then $f(x) = mx + b$, for some real numbers m and b . Suppose $f(3x) = 3f(x)$ and $f(x + 2) = f(x) + 2$. Find m and b .

5. (8 points) A lakefront runs east-west. A man in a rowboat is 5 miles due north of a point A on the shore. He wishes to get to C , 5 miles due east of A . He will row in a straight line to a point B between A and C and walk the rest of the way. He rows 3 miles per hour and walks 4 miles per hour. Let x be the distance between B and C . Find a function $T(x)$ that gives the total time of the trip in terms of x .

6. (10 points) A farmer with 800 feet of fencing wants to enclose a rectangular area and then divide it into five pens with fencing parallel to two opposite sides of the rectangle.



- (a) In terms of x and y , how much fencing will the farmer use?
- (b) Assuming the farmer uses all 800 feet of fencing, find an expression for y in terms of x .
- (c) Find the maximum total area the farmer can enclose.