Math 123 Exam 1B

October 6, 2010 Professor Ilya Kofman

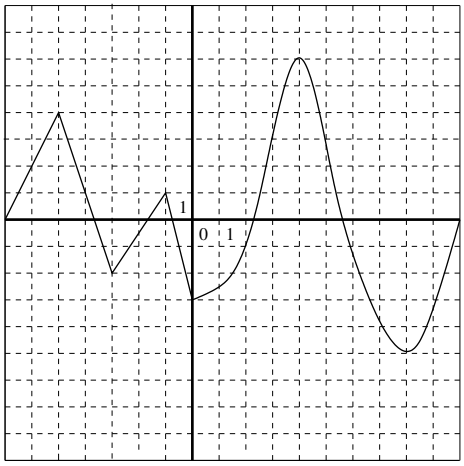
NAME: _____

1. (*20 points*)

(a) Find the equations of the line passing through points $(3, 1)$ and $(5, 4)$. Write your final answer in the slope-intercept form $y = mx + b$.

(b) Let $f(x) = 2x^2 + 8x - 5$. Does $f(x)$ have a maximum or minimum? Find this max or min value, and find where it occurs.

2. (*20 points*) Let $y = f(x)$ be the graph given below.



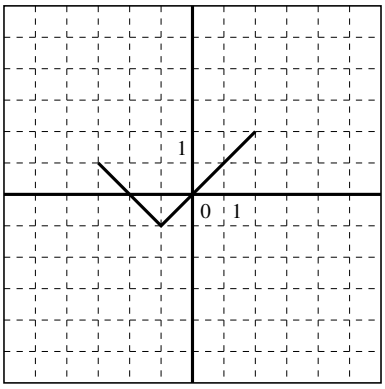
(a) Write the values $f(4),\ f(-1),\ f(-3)$.

(b) What are the max and min values of $f(x)$ on the domain $-2 \leq x \leq 1$?

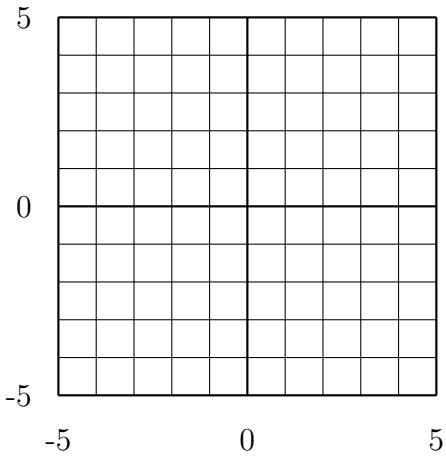
(c) On which intervals for $x \geq 0$ is $f(x)$ increasing?

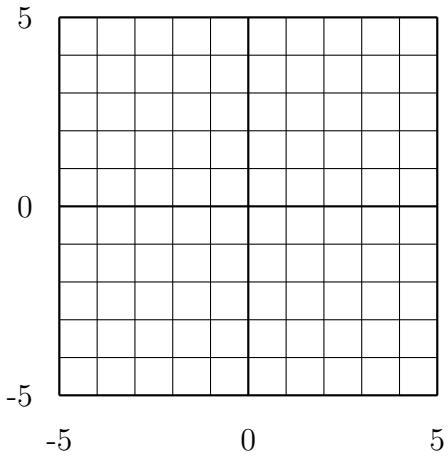
(d) Find the average rate of change of $f(x)$ on the interval $[-5, 0]$.

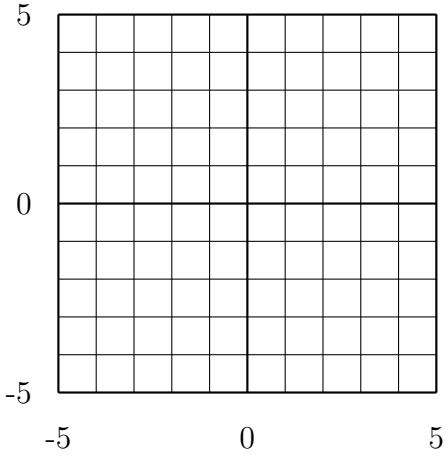
3. (*20 points*) The graph of $y = f(x)$ is as shown.

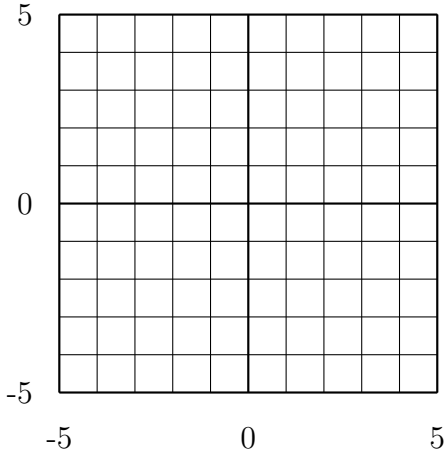


Sketch the graphs of the following functions:
(1) $y = f(x) + 1$ (2) $y = f(x + 1)$ (3) $y = -f(x)$ (4) $y = 2 - f(x)$.





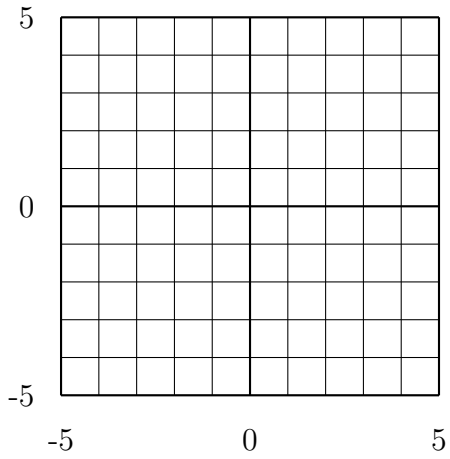




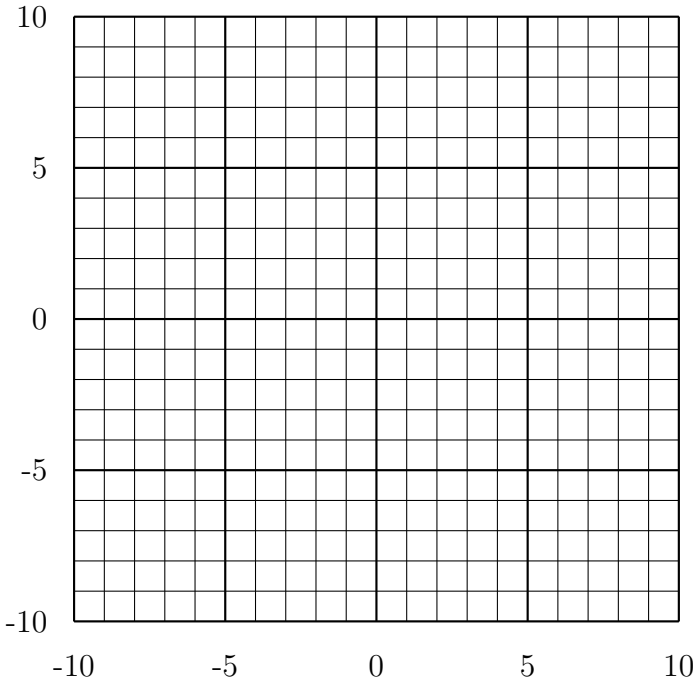
4. (a) (*10 points*)

$$f(x) = \begin{cases} 1 - x & \text{if} \quad x \geq -1 \\ 2 + x & \text{if} \quad x < -1 \end{cases}$$

Sketch graph of $y = f(x)$.



(b) (*15 points*) Convert the function $f(x) = 3x^2 - 6x + 5$ to standard form $y = a(x - h)^2 + k$ and sketch its graph.



5. (*16 points*) Match the equations with their graphs.

(a) $4x - 3y = 8$ Graph: _____

(b) $2x + 3y = 6$ Graph: _____

(c) $y = x^2 - 3x - 3$ Graph: _____

(d) $y = 5x - x^2 - 4$ Graph: _____