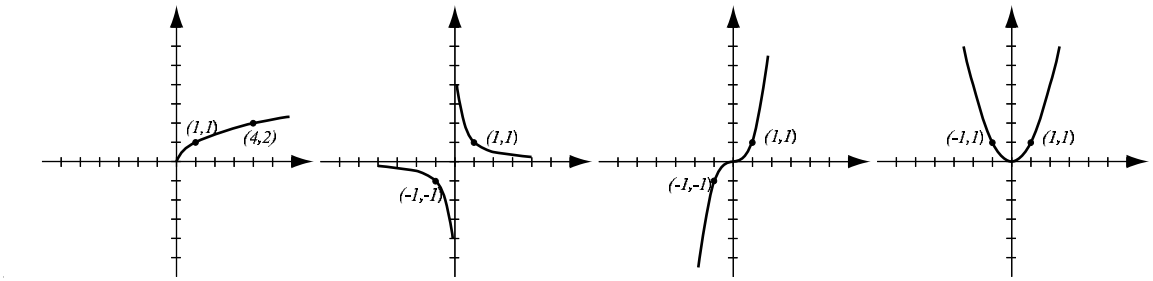
Spring '06/MAT 140/Exam 2a **Name:** *Show all your work.*

1. (4pts) The following are graphs of basic functions. Write the equation of the graph under each one.



2. (4pts) Find the domain of the function $f(x) = \sqrt{3 - 2x}$.

3. (5pts) Find the equation of the line that passes through $(-2, 3)$ and is parallel to the line that passes through the two points $(-1, -2)$ and $(4, 1)$. Draw both lines in the same coordinate system.

4. (5pts) Find the equation of the circle whose center is $(3, -2)$ that is tangent to the y-axis. Draw the circle.

5. (10pts) Use the graph of the function f at right to answer the following questions.

a) What is the domain of f?

b) What is the range of f?

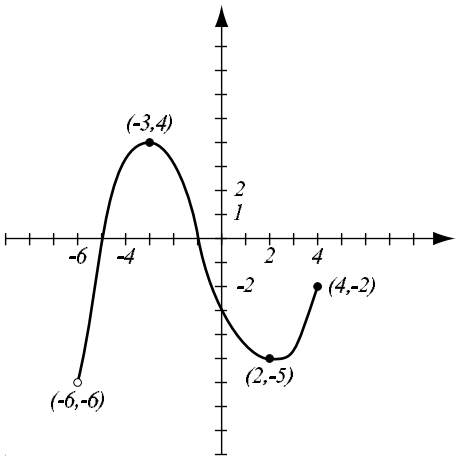
c) Find $f(0)$ and $f(-3)$.

d) List the x-intercepts of the graph.

e) Where does f have a local minimum? What is its value?

f) What are the solutions of the equation $f(x) = 3$?

g) For which x is $f(x) > 0$?



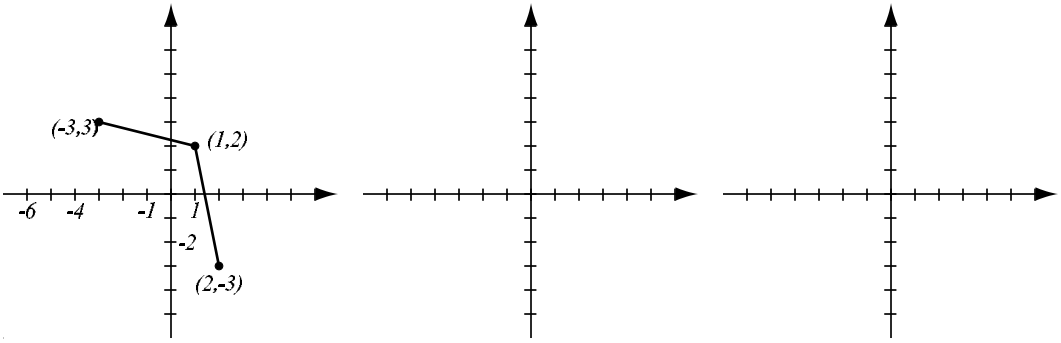
6. (5pts) The Marx brothers bought a new banana dispenser for \$1700 that they plan to depreciate over 4 years.
a) Write the linear function that expresses the value of the dispenser after x years.
b) Sketch the graph of the function.
c) What is the value of the dispenser after 3 years?

7. (7pts) The function $f(x) = x^3 - 5x^2 + 3x - 1$ is given.
a) Determine algebraically whether this function is even, odd or neither.
b) Sketch the graph of f on paper. Why does your picture support what you found in a)?
c) List the intervals where f is increasing or decreasing. Accuracy: 2 decimal points.

8. (5pts) Sketch the graph of the piecewise-defined function:

$$f(x) = \begin{cases} 2 - x, & \text{if } x \leq -3 \\ 2x + 3, & \text{if } -3 < x < 2. \end{cases}$$

9. (5pts) The graph of the function f is given below. On separate graphs, sketch the graphs of the functions $f(x+2)$ and $-2f(x)$. Label all the relevant points.



Bonus. (5pts) The following is an equation of a circle. Bring the equation into standard form in order to find its center and radius.

$x^2 - 8x + y^2 + 6y + 10 = 0$