

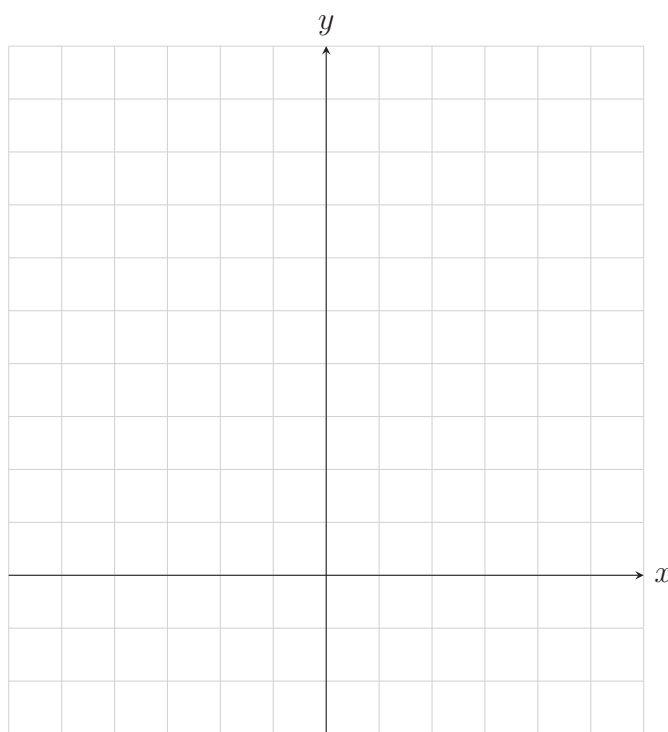
Math 111 Supplemental HW on Piecewise Defined Functions

Name: _____

1. A function f defined as

$$f(x) = \begin{cases} -2 & \text{if } x \leq -2 \\ \frac{1}{2}x - 1 & \text{if } -2 < x < 3 \\ -(x - 3)^2 + 2 & \text{if } x \geq 3 \end{cases}$$

a. Graph $y = f(x)$.



b. Find $f(-2)$, $f(1)$, and $f(2)$.

d. Determine the domain and range of f .

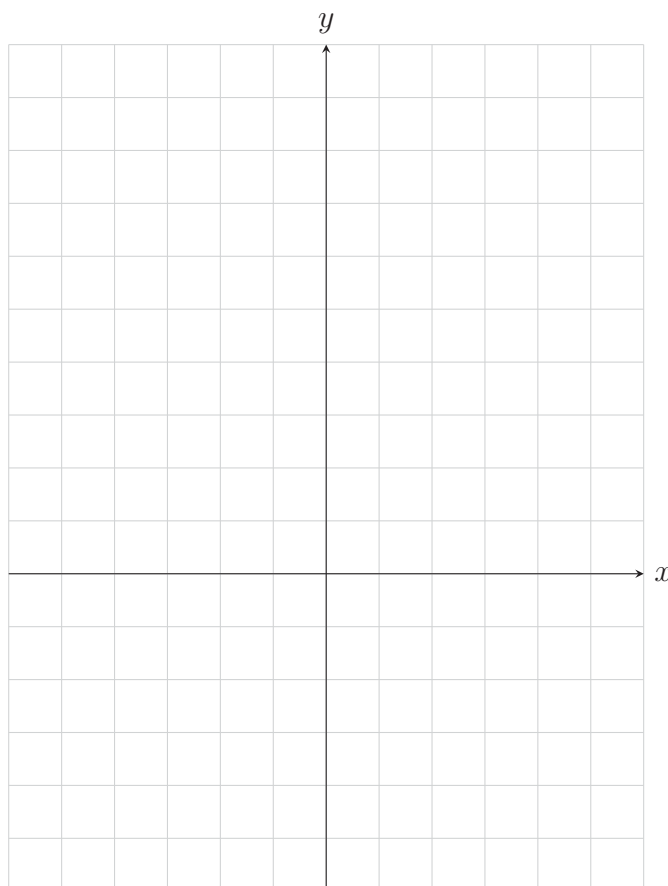
c. Locate any intercepts.

e. Is f continuous on its domain?

2. A function f defined as

$$f(x) = \begin{cases} \sqrt[3]{x+2} & \text{if } x < -2 \\ 2 & \text{if } x = -2 \\ -x+2 & \text{if } x > -2 \end{cases}$$

a. Graph $y = f(x)$.



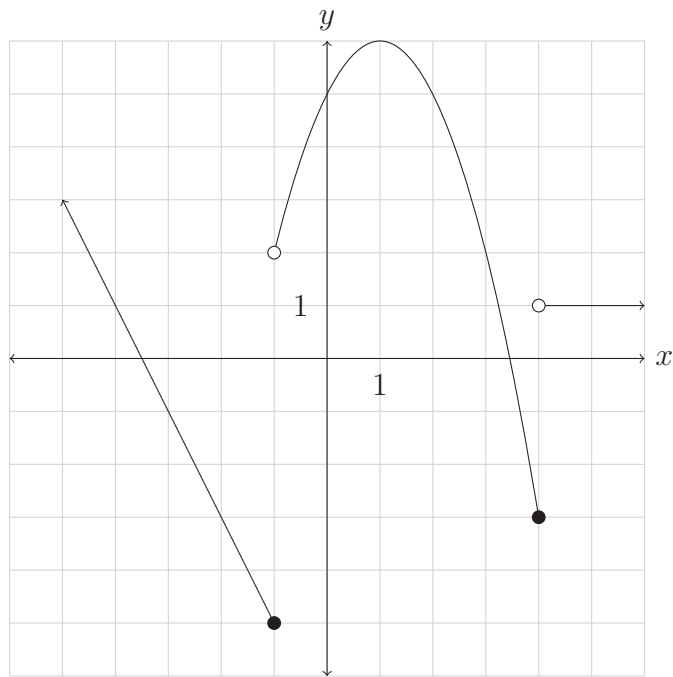
b. Find $f(-2)$, $f(-1)$, and $f(0)$.

d. Determine the domain and range of f .

c. Locate any intercepts.

e. Is f continuous on its domain?

3. The graph of a piecewise-defined function is given. Write a definition for the function.



4. A gas company has the following rate schedule for natural gas usage in single-family residences:

Monthly Customer Charge of \$8.40

Distribution Charges of:

1st 20 therms \$0.5773 per therm

Next 30 therms \$0.4879 per therm

Over 50 therms \$0.4819 per therm

- a. What is the total gas bill if 40 therms are used in a month? b. What is the total gas bill if 150 therms are used in a month?

- c. If C is the total monthly gas bill for x therms used in a month, develop a model relating the total bill to the therms used. That is, express C as a function of x . Begin by graphing $C = C(x)$.

