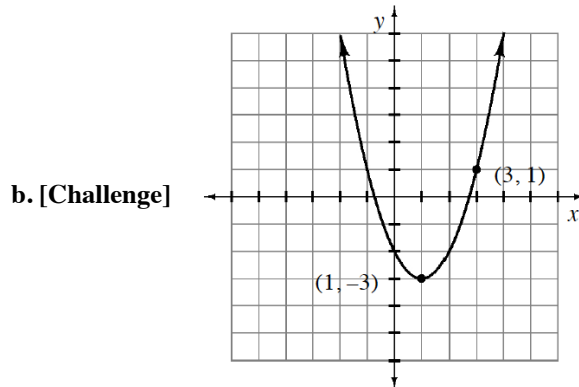
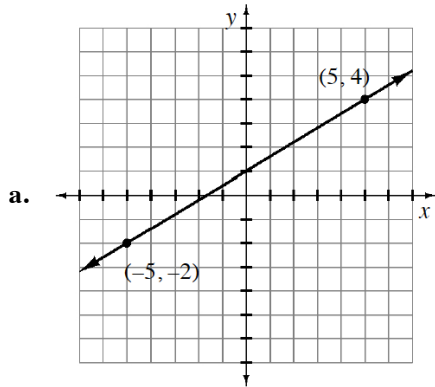


Homework #9

First & Last Name: _____ Class: _____

For homework to be graded, it must be *fully completed*. This means you must **show your work**.

1. Write a possible equation for each of the following graphs. Verify your equations using Desmos.
[Desmos](https://www.desmos.com/calculator/uzobu09d7c) (desmos.com/calculator/uzobu09d7c).



2. Much of this course will focus on examining how functions grow. Examine two ways a straight line grows by completing the parts below.
- Sketch $f(x) = 2x + 3$. What are $f(0)$, $f(1)$, $f(2)$, and $f(3)$? How does f grow as x increases?
 - Sketch $g(x) = -3x + 10$. What are $g(0)$, $g(1)$, $g(2)$, and $g(3)$? How does g grow as x increases?

3. [Challenge] Selected values of a continuous even function are shown below. [Desmos](https://www.desmos.com/calculator/dfnyxdpo0l) (desmos.com/calculator/dfnyxdpo0l).

x	0	1	2	3
$f(x)$	0	2	4	6

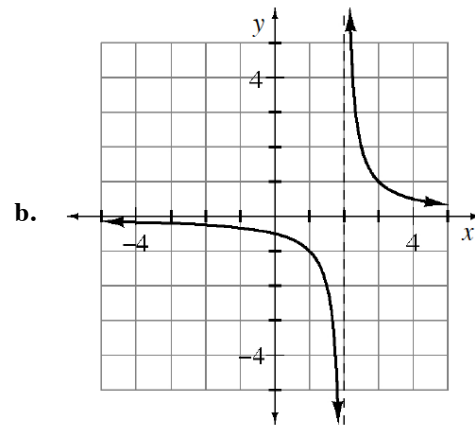
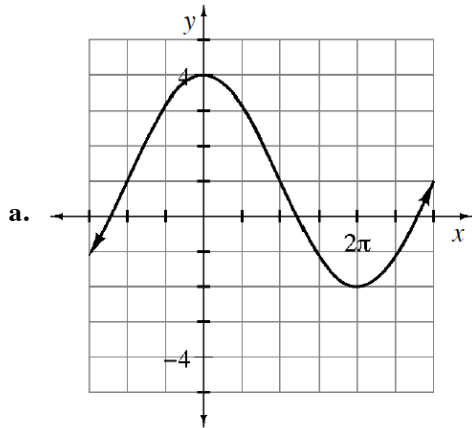
- What are $f(-1)$, $f(-2)$, and $f(-3)$?
 - Sketch a possible graph of the function on the domain $-3 \leq x \leq 3$.
 - Sketch another possible graph of the function on the domain $-3 \leq x \leq 3$.
 - Can the graph be a quadratic function? If so, write a possible equation for the function. If not, explain why not.
4. State the domain of each of the following functions.
- $f(x) = \sqrt{x+2}$
 - $g(x) = \frac{1}{x-4} + 3$
 - [Challenge] $h(x) = \log(x-4)$
 - [Challenge] $j(x) = \sqrt{\frac{2-x}{x}}$
5. Helen thinks $\sqrt{x^2} = x$. Felicia does not agree.
- Use various values of x to check whether or not Helen is correct.
 - Write an accurate expression for $\sqrt{x^2}$
6. Sketch $f(x) = 3\sqrt{x+1}$ on $0 \leq x \leq 6$ three times, on three different sets of axes.
- Review your work from problems 1-25 and 1-36. Use a similar process to approximate the area under the curve for $0 \leq x \leq 6$ using:
 - Six left endpoint rectangles.
 - Six right endpoint rectangles.

iii. Six trapezoids.

b. Which approximations were overestimates of (greater than) the actual area? Which were underestimates? Explain.

c. Which approximation is the most accurate? Explain.

7. Use interval notation to state the domain and range of each function below.



8. A can of soda is 42°F when purchased. Over the course of the next few hours, the temperature of the soda slowly rises. During an experiment, Shibisha used a thermometer and recorded the temperature at various times, t , shown in the table below.

Time [min]	0	10	30	45	60	75	80
Temp. [$^{\circ}\text{F}$]	42	51	58	63	66	68	69

a. Sketch a graph of this situation.

b. When is the temperature changing the fastest? How can you see this on the graph?

c. Approximately how fast is the temperature changing during the first 10 minutes? How can you tell?

9. Each of the continuous functions in the table below is increasing, but each increases differently. Match each graph below with the function that grows in a similar fashion in the table.

x	1	2	3	4	5	6	7	8	9
$f(x)$	15.5	19.	22.5	26.	29.5	33.	36.5	40.	43.5
$g(x)$	1	2	4	8	16	32	64	128	256
$h(x)$	12	76	108	124	132	132	138	139	139.5

