

MTH 161: Carney

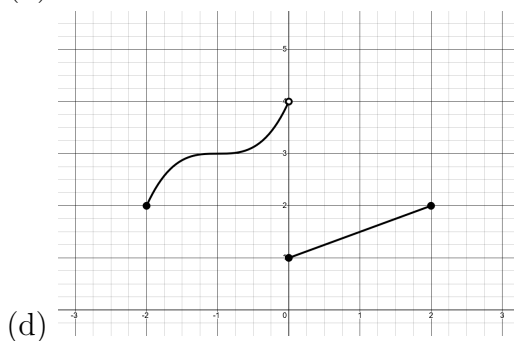
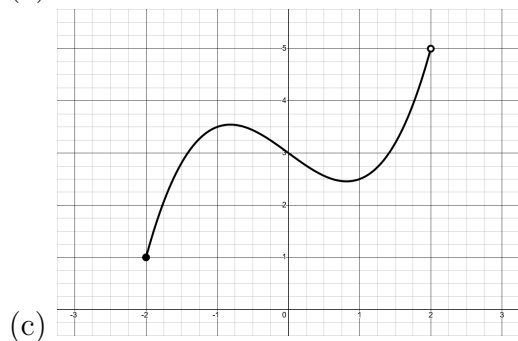
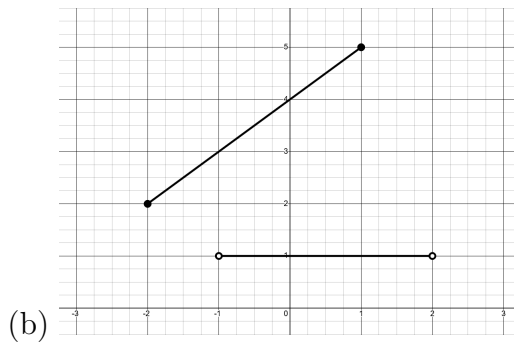
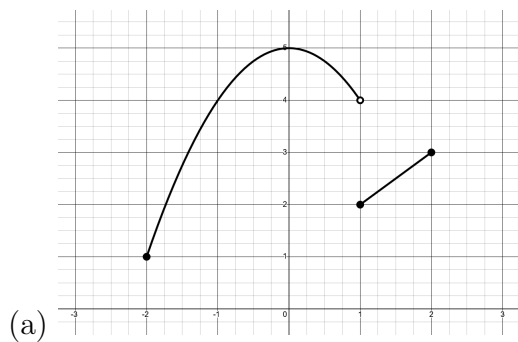
Study Guide Test 1

Name: _____

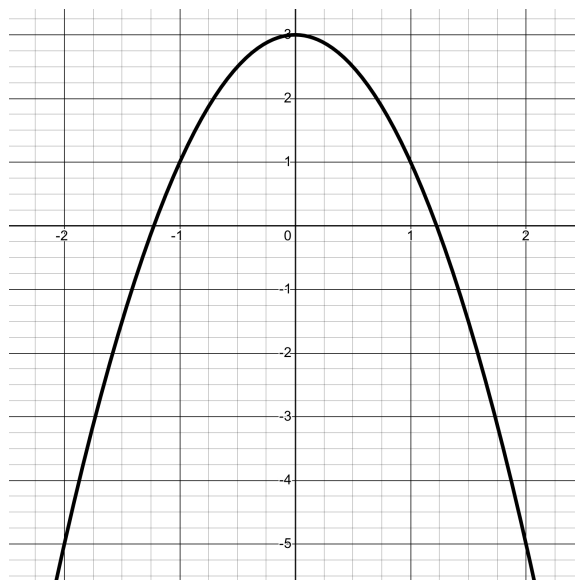
1. Given $f(x)$ by the following table, find $f(0)$, $f(2)$, and $f(3)$.

x	-1	4	2	3	0	-3
$f(x)$	2	2	0	-1	8	3

2. Given the following graphs, decide for each one if it passes the vertical line test and if it passes the horizontal line test. Then, decide if each graph is a function and if it is one-to-one.



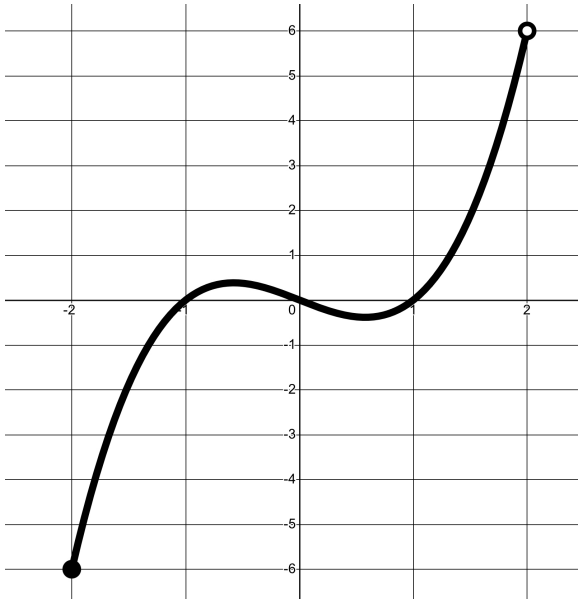
3. Given the following graph of a function, find $f(-1)$, $f(1)$, and $f(2)$.



4. Here are the names of all functions from the library of functions we may use in this class. Draw a graph for each one.

1. $y = x$
2. $y = |x|$
3. $y = x^2$
4. $y = \sqrt{x}$
5. $y = x^3$
6. $y = \sqrt[3]{x}$
7. $y = b^x$
8. $y = \log_b(x)$
9. $y = \frac{1}{x}$
10. $y = \frac{1}{x^2}$
11. $y = \lfloor x \rfloor$
12. $y = C$

5. Look at the graph of the following function. Find its domain and range, and write it in interval and set-builder notation.



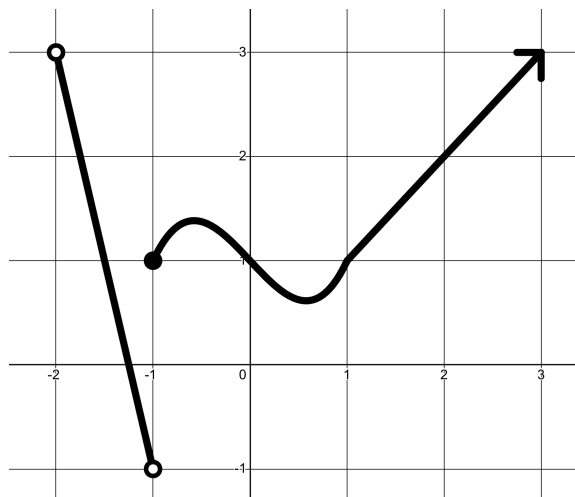
6. Given the following intervals, finish the chat by drawing number lines, converting interval notation to set-builder notation, and converting set-builder notation to interval notation.

Number line	Interval notation	Set-builder notation
	$(-3, 5]$	$\{x : x \leq 2\}$
	$(-\infty, \infty)$	
	$[10, 11)$	$\{x : -4 < x < 0\}$
	$(-\infty, 1) \cup (1, \infty)$	

7. Graph the following piecewise function:

$$h(x) = \begin{cases} -x + 4 & \text{if } x < -1 \\ 2 & \text{if } -1 \leq x \leq 2 \\ 3x & \text{if } x > 2 \end{cases} \tag{1}$$

8. Find the domain and range of the following function. Write it in set-builder and interval notation.

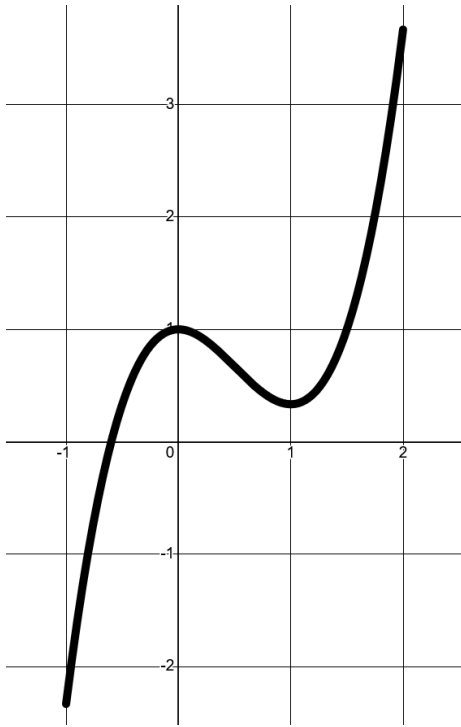


9. Given the following table, find the average rate of change on the intervals $(0, 1)$, $(1, 2)$, $(-1, 2)$, and $(0, 2)$.

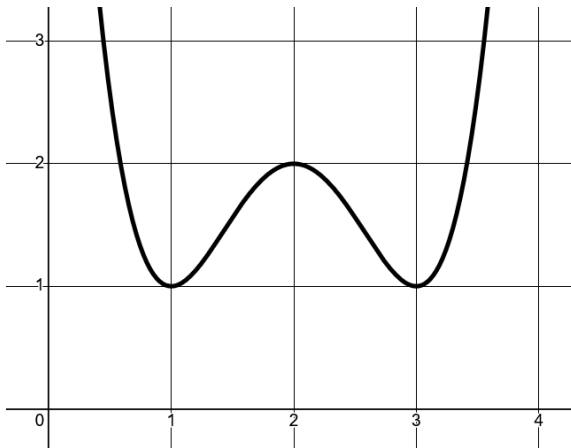
x	-2	-1	0	1	2	3
$f(x)$	3	0	4	2	-1	-2

10. Given $g(x) = 3x + 1$, find the average rate of change on the interval $[a, a + h]$. Assume a and h are arbitrary variables. Your answer might have variables in it. Use this information to find the average slope on an interval of length 3 of $g(x)$.

11. Given the following function, determine the intervals on which it's increasing and the intervals on which it's decreasing. Additionally, determine the intervals on which it's concave up and concave down. Guess the location of any points on the graph if it isn't clear. Make sure your answers are either in interval or set-builder notation.

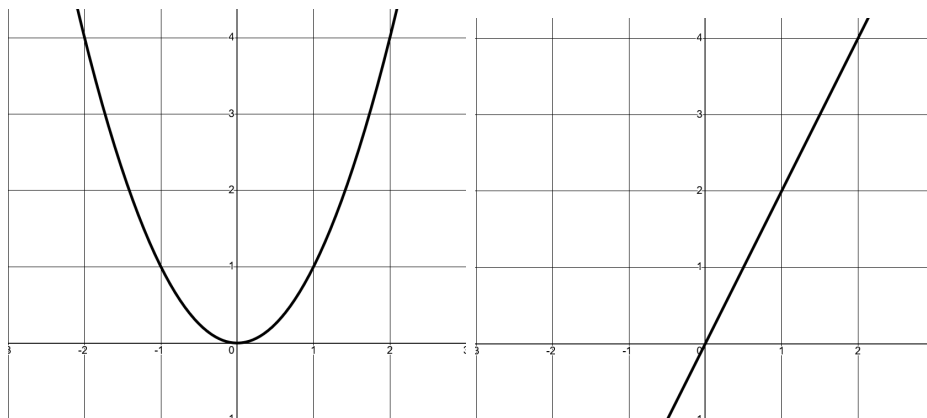


12. Find every local extreme point for the following graph.



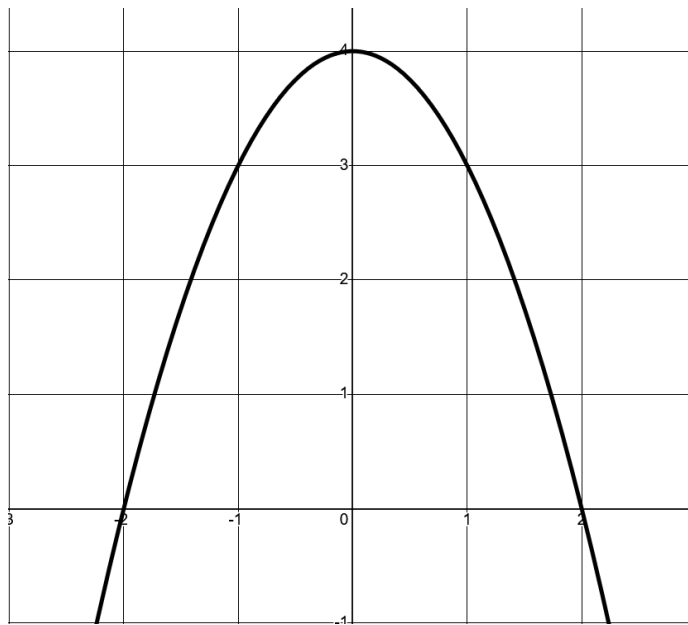
13. Given the function $j(x) = ax^2 + bx + c$, find the difference quotient of $j(x)$. Treat a , b , and c as unknown numbers. Your final answer should have some of these unknown values in it. Use this answer to find the difference quotient of x^2 .

14. Given the following graphs, find $f(g(0))$, $f(f(-1))$, $g(g(1))$, and $g(f(2))$. If they don't exist, write DNE.



15. Given $f(x) = \frac{3}{x}$ and $g(x) = x^2 - 3x + 2$, find $f \circ g(x)$, find $g \circ f(x)$, and find the domain of each.

16. Given the following graph of $p(x)$, graph $\frac{1}{2}p(x) + 1$.



17. Given the following table of $q(x)$, graph $3q(\frac{1}{2}x - 1) + 2$.
- | | | | | | |
|--------|----|----|---|---|---|
| x | -2 | -1 | 0 | 1 | 2 |
| $q(x)$ | 0 | -1 | 0 | 1 | 0 |

18. Given the function $k(x) = \frac{2}{x^3 - 1}$, find $k^{-1}(x)$. Use $k(x)$ and $k^{-1}(x)$ to find the domain and range of $k(x)$. Remember to use either interval or set notation.

19. Given the function $s(x) = x^2 + 6x + 9$, find $s^{-1}(x)$. You will need to restrict the domain in order to do so.
20. Given the following graph of a function, find its inverse.

