Math 1130
Spring 2019
Sample Exam 1a
1/31/19

Name (Print): _____

Username.#: _____

Lecturer: _____

Rec. Instructor: _____

Rec. Time: _____

This exam contains 9 pages (including this cover page) and 9 problems. Check to see if any pages are missing. The exam is worth 100 points. The value of each question is listed below.

The following rules apply:

- You have **55 Minutes** to complete this exam.

- You may **not** use your books or notes on this exam.

- Please write clearly.

- **Partial Credit**: You are required to show your work on each problem of this exam. Incorrect answers with supporting work may receive partial credit. Any questions without supporting work will receive no credit. Partial credit might not be awarded on some questions.

- Calculators are permitted with the exception of calculators that have symbolic algebra or calculus capabilities. In particular, the following calculators (and their upgrades) are not permitted: TI-89, TI-92, TI-Nspire CX CAS, and HP-49. In addition, neither PDAs, laptops, nor cell phones are permitted.

- Unless otherwise specified, make sure your answers are in **exact form** (i.e. not a decimal approximation).

- Please write your answers in the boxes provided unless otherwise instructed.

- A random sample of graded exams will be copied before being returned.

| Page	Points	Score
2	15	
3	16	
4	10	
5	13	
6	20	
7	18	
8	8	
Total:	100	

1. (a) (5 points) In the space provided, graph a line with x-intercept at $x = 3$ and slope $\frac{1}{3}$.
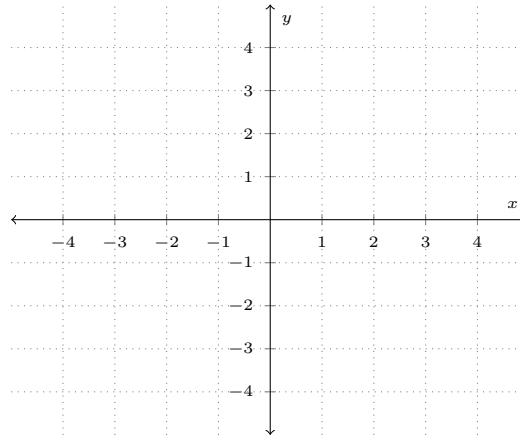
(b) (5 points) Determine the equation of the line described in part (a). Give your answer in slope-intercept form.

(c) (5 points) Determine the equation of a line perpendicular to the line described in part (a) passing through the point $(1, 7)$. Give your answer in point-slope form.

2. Let $f(x)$ be the piecewise defined function $f(x) = \begin{cases} -x - 1 & \text{if } -4 < x \leq 0 \\ \sqrt{x} + 2 & \text{if } 0 < x < 4. \end{cases}$

(1)

(2)

(3)

(4)
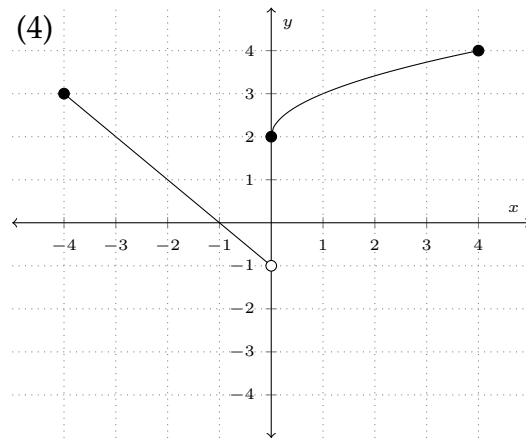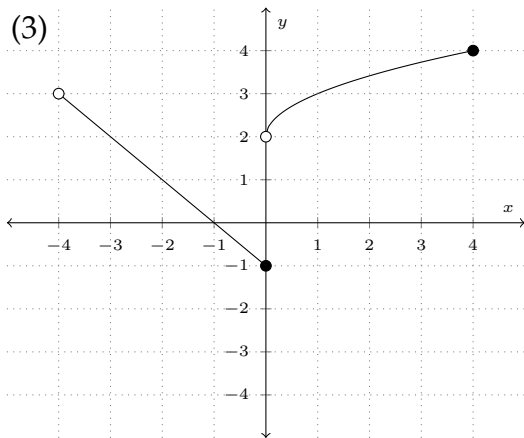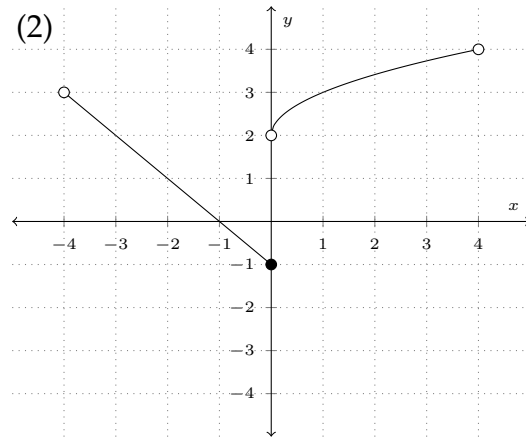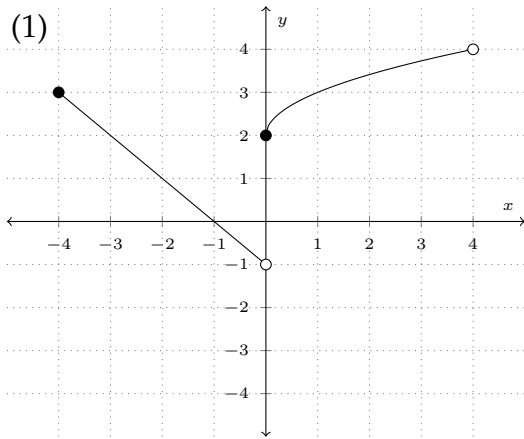
(a) (4 points) What is the domain of f? Write your answer in interval notation.

The domain of f is _____

(b) (4 points) What is the range of the function depicted in graph (3)? Write your answer in interval notation.

The range of function (3) is _____

(c) (4 points) Which graph above (1-4) is the graph of $f(x)$?

(d) (4 points) Which graph(s) above (1-4) contain the point $(-4, 3)$?

3. Let the demand equation for churros be $p = 5(14 - q)$.

   (a) (4 points) Determine the revenue equation.

$$r = \boxed{}$$

   (b) (6 points) Solve for the values of q that give $r = 240$. Show all algebra necessary to solve this problem. Solutions by calculator will receive no credit.

$$q = \boxed{}$$

4. Solve the equations below algebraically. Show all of your work. Solutions by calcula-tor will receive no credit.

  (a) (8 points)
  $$\frac{y^2 - 8y}{8 - y} = -3$$

$y =$ [   ]

  (b) (5 points) Solve for r in the equation $S = P(1 + rt)$

$r =$ [   ]

5. (10 points) Let $h(x) = \dfrac{x-7}{x+2}$ and $g(x) = \dfrac{1}{\sqrt{x}}$.

(a) Determine the composition $(h \circ g)(\frac{1}{4})$.

$$(h \circ g)(\tfrac{1}{4}) = \boxed{}$$

(b) Determine the composition $(g \circ g)(16)$

$$(g \circ g)(16) = \boxed{}$$

6. Let $f(x) = \dfrac{2}{x+1}$.

(a) (6 points) Determine the expression for $\dfrac{f(x+h) - f(x)}{h}$. You must simplify your result.

$$\dfrac{f(x+h) - f(x)}{h} = \boxed{}$$

(b) (4 points) Evaluate your simplified result in part (a) at $h = 0$ and $x = 2$. If you find yourself dividing by zero, then you did not simplify part (a) correctly!

Your result is $\boxed{}$

7. An advertiser goes to a printer and is charged $89 for 100 copies of one flyer and $93 for 200 copies of another flyer. This printer charges a fixed setup cost plus a charge for every copy of single-page flyers.

   (a) (6 points) Find a function that describes the cost of a printing job, if x is the number of copies made.

   Cost =

   (b) (6 points) If the total cost is $100, how many flyers were printed?

   Answer:

8. (6 points) Solve the inequality given below. Give your answer in interval notation.
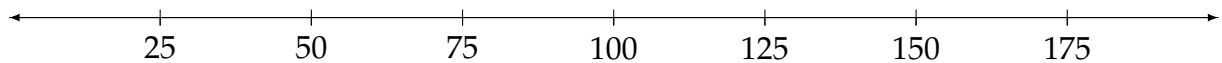
$$3(x - 2) - 5 \geq 4x + 2$$

   Answer:

9. (8 points) Suppose that you know that the revenue and cost equations for selling baskets of cheesy nachos are

$$r(q) = 4.57q$$
$$c(q) = 3.49q + 70,$$

respectively. q represents the quantity of baskets of cheesy nachos sold. Determine the values of q that will make the profit positive. Then graph those values on the number line provided. Make sure you label your graph and use square brackets/parentheses as necessary!

25	50	75	100	125	150	175

Scrap work