

Math 1130
Autumn
Sample Exam 1a

Name (Print): _____

Username.#: _____

Lecturer: _____

Rec. Instructor: _____

Rec. Time: _____

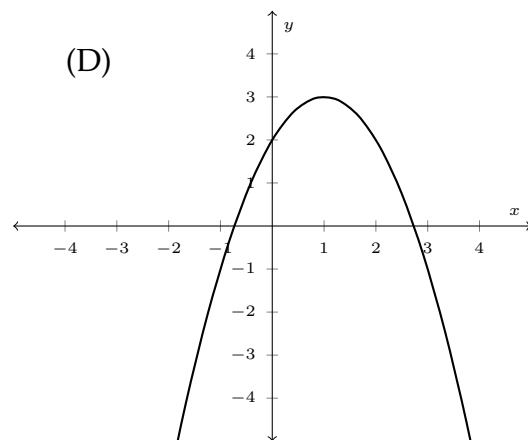
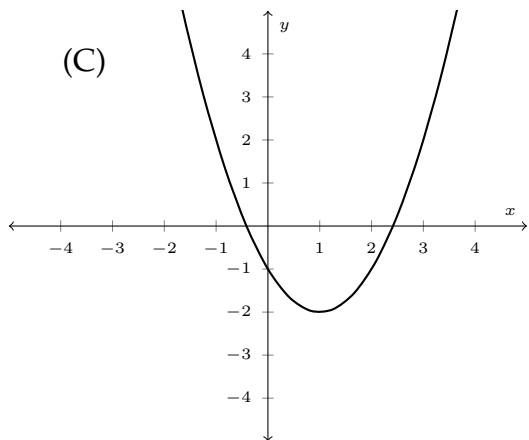
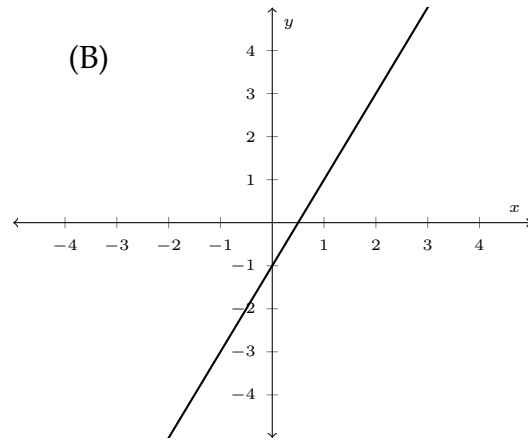
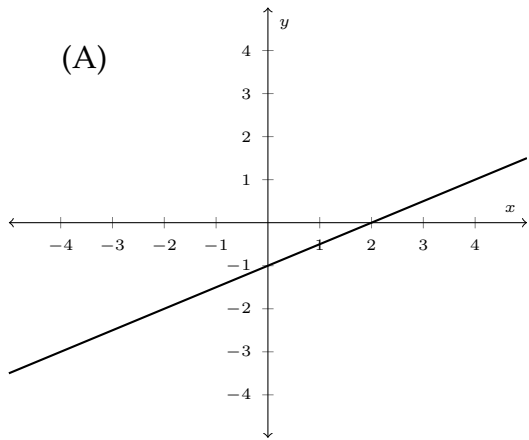
This exam contains 10 pages (including this cover page) and 8 problems. Check to see if any pages are missing. The exam is worth 100 points. The value of each question is listed below.

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	12	
3	22	
4	12	
5	12	
6	12	
7	10	
8	12	
9	8	
Total:	100	

1. The graphs shown here (labeled (A)-(D)) satisfy certain characteristics. Match the description given in each part with one of the graphs shown here. Graphs may be used more than once.

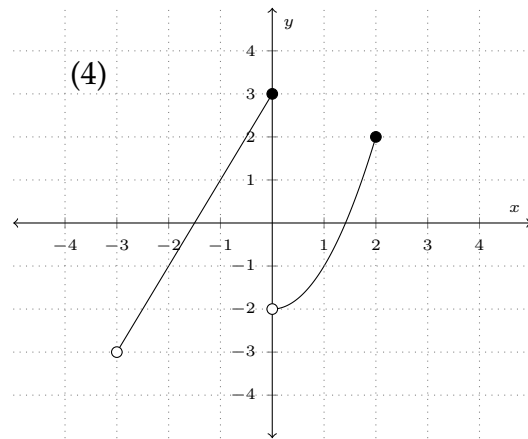
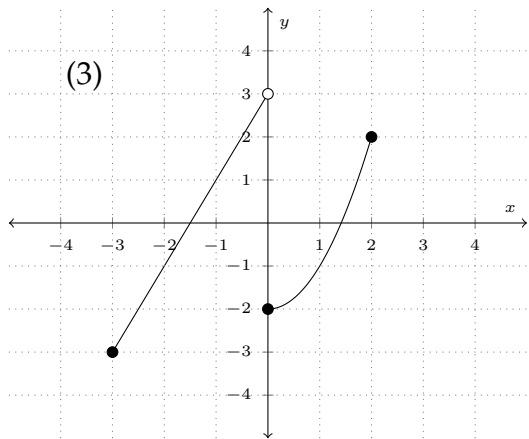
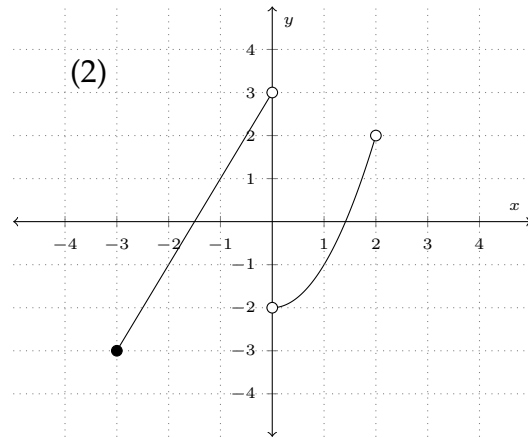
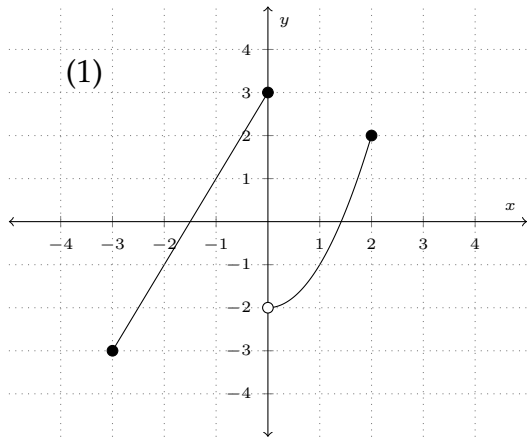


- (a) (4 points) This graph is a line with x -intercept at 2. This best describes graph

- (b) (4 points) This graph is a parabola with leading coefficient $a < 0$. This best describes graph

- (c) (4 points) This graph is a parabola. It's graph contains the point $(1, 3)$.

The following diagrams will be used in the question below.



2. Let $f(x)$ be the piecewise defined function $f(x) = \begin{cases} 2x + 3 & \text{if } -3 < x \leq 0 \\ x^2 - 2 & \text{if } 0 < x \leq 2. \end{cases}$

(a) (6 points) What is the domain of f ? Write your answer in interval notation.

The domain of f is

(b) (6 points) What is the range of $f(x)$? Write your answer in interval notation.

The range of f is

(c) (6 points) Which diagram above (1-4) is the graph of $f(x)$?

(d) (4 points) Which diagram above (1-4) contains the point $(0, -2)$?

3. Solve the equations. Show all of your work. Solutions by calculator will receive no credit.

(a) (6 points) $\sqrt{y} + \sqrt{y + 4} = 3$. Write your answer as a fraction.

$$y = \boxed{}$$

(b) (6 points) Solve for r in the equation $S = P(1 + r)^9$

$$r = \boxed{}$$

4. Let $f(x) = \frac{x+4}{x-1}$ and $g(x) = \sqrt{x}$.

(a) (4 points) Determine the composition $(f \circ g)(x)$.

$$(f \circ g)(x) = \boxed{}$$

(b) (4 points) Determine the value of $(f \circ f)(2)$.

$$(f \circ f)(2) = \boxed{}$$

5. (4 points) Let $f(x) = -2x^2 + 3x$. Determine the expression for $\frac{f(x+h) - f(x)}{h}$. You must simplify your result.

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

6. (a) (6 points) Suppose that the equation of a line is $y = -2x + 3$. The parallel line passing through the point $(3, 4)$ is given by the equation $y = mx + b$. Determine the values of m and b .

$$m = \boxed{}$$

$$b = \boxed{}$$

- (b) (6 points) Solve the inequality given below. Give your answer in interval notation.

$$-3(x + 1) + 1 > -2x - 1$$

The interval is

7. At \$5.58 per burrito, the annual supply of burritos is 3.4 (in billions). When the price increases to \$7.38 the annual supply of burritos increases to 5.8 (in billions). Assume that both the supply and demand equations are linear. Let p denote the price (in dollars) of a burrito, and let q denote the quantity of burritos (in billions).

- (a) (6 points) Determine the supply equation. Write in the form $p_{supply} = aq + b$, and write a and b as **exact values** (i.e. no rounding).

$$p_{supply} = \boxed{}$$

- (b) (4 points) Using your supply equation, determine the quantity of burritos supplied (in billions) given a price of \$6. **Give your answer to two decimal places.**

$$q = \boxed{}$$

8. (8 points) A total of \$20,000 was invested in two business ventures, A and B. At the end of the year A and B yielded returns of 5% and 8%, respectively. How much money went into business venture A if the total amount earned was \$1225? Give your answer to two decimal places.

The amount given to business venture A was

Scrap work