Name:
Recitation Instructor:
Recitation Day and Time:

Studio College Algebra – Exam 1 – Spring 2019

Directions: You will find 16 problems listed below. Each problem is worth 5 points. No notes/books/friends are allowed. Graphing calculator models above the level of a TI-84 plus are not allowed (in particular, calculators with a built in CAS and/or QWERTY keyboard are not allowed). You have one hour to complete this exam.

1. Consider $g(x) = |2x + 5| - 1$. Answer the following:

   (a) Find $g(-3)$.

   (b) Find $g(-1)$.

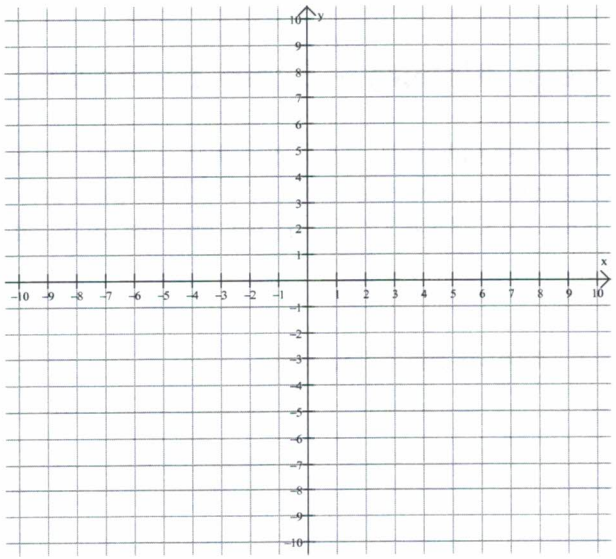
   (c) Find $g(0)$.

   (d) Find $g(2)$.

   (e) Find $g(4)$.

2. Solve for x in the equation $6(2x - 1) + 4 = 3x - 8$.

3. Graph $4x + y = 2$ on the grid below. Include all intercepts.



4. Solve $|2x - 7| = 8$ and check your answers.

5. Solve $2|x + 10| = 8$.

6. Solve $|x + 7| = -1$.

7. A truck depreciates in value according to a linear model. If the initial value of the truck is \$30,000, and the value sixty years later is \$0, find a linear function that describes the value of the truck after t years.

8. Suppose a line passes through (5,9) and (0,3). What is the slope of the line passing through these points?

9. What is the domain of the function $f(x) = \dfrac{3}{20 - 4x}$?

10. The weekly profit function for a business is $P(x) = 70x - 100$, where x is the number of customers. How many more customers must the business add if it wants to increase profits by \$2100 per week?

11. The temperature T in degrees Celsius inside a concert hall m minutes after a power outage during a winter concert is given by $T(m) = -0.4m + 18$. Find $T(3)$. What is the meaning of your answer?

12. The equation $5F - 9C = 160$ gives the relationship between Fahrenheit and Celsius temperature measurements, where F is the temperature in Fahrenheit and C is the temperature in Celsius. What Celsius measure corresponds to a Fahrenheit measure of 40 degrees? Round your answer to the nearest tenth.

13. Suppose the number of cell phone subscribers (in millions) between the years 1995 and 1999 is described by the model $P(x) = 12.25x + 28$, where x is the number of years since 1995. Find and interpret the meaning of $P(1)$.

14. Suppose the total cost function for the production of a ceramic bowls is given by $C(x) = 10x+1200$, where x is the number of bowls produced. What is the domain of the function IN CONTEXT of the situation?

15. Find K if $x = 5$ is a solution for $Kx + 1 = 2x - K$.

16. In a controlled lab environment, some organisms exhibit constant growth over a specific time period. Suppose a certain organism starts out weighing 10 mg, and grows to 18 mg over a 24 hour time period. Find a linear model that describes the growth of the organism for $0 \leq t \leq 24$ hours. (Hint: Find a linear function $f(t) = mt + b$ that fits with this situation with m and b filled in. You will have to figure out what m and b are for this situation. We want the actual function, not just a graph or picture.)