Name:
Recitation Instructor:
Recitation Day and Time:

Studio College Algebra – Exam 1 – Spring 2017

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 $g(x) = 3x^2 - 4dx$, where d is some external parameter. Answer the following:

    (a) Find $g(-2)$.

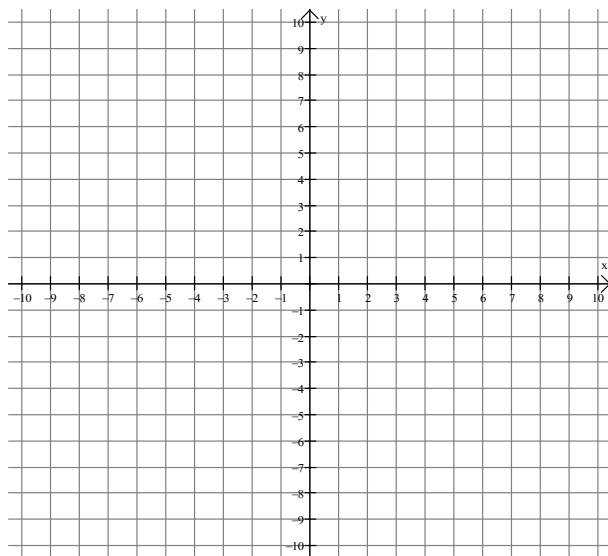   (b) Find $g(-1)$.

    (c) Find $g(0)$.

    (d) Find $g(1)$.

    (e) Find $g(2)$.

2. Solve for x in the equation $3(2x + 1) + 5 = 2x - 9$.

3. Graph $2x - 3y = 6$ on the grid below. Include all intercepts.

4. Solve $|x - 1| = 2x + 5$ and check your answers.

5. Solve $|x - 7| < 8$.

6. Solve $|x + 3| > 12$.

7. A truck depreciates in value according to a linear model. If the initial value of the truck is $40,000, and the value twenty years later is $0, what was the depreciated value of the truck after 13 years?

8. Suppose a line passes through (0,2) and (-5,9). What is the equation of the line passing through these points?

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

10. The weekly profit function for a business is $P(x) = 15x - 300$, where x is the number of customers. How many more customers must the business add if it wants to increase profits by $750 per week?

11. The temperature T in degrees Fahrenheit inside a concert hall m minutes after a power outage during a winter concert is given by $T(m) = -0.4m + 80$. What is the meaning of the y-intercept in this function?

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 64 degrees? Round your answer to the nearest tenth.

13. Suppose the number of cell phone subscribers (in millions) between the years 1993 and 1997 is described by the model $P(x) = 12.25x + 28$, where x is the number of years since 1993. Find and interpret the meaning of $P(2)$.

14. Suppose the total cost function for a certain product is given by $C(x) = 35x + 100$ and the revenue function for the product is given by $R(x) = 75x$. Find a profit function for this situation.

15. Find M if $x = 2$ is a solution for $Mx + 9 = 3x - M$.

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 14 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.)