Name:
Recitation Instructor:
Recitation Day and Time:

Studio College Algebra – Exam 1 – September 13, 2016

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

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

   (b) Find $g(0)$.

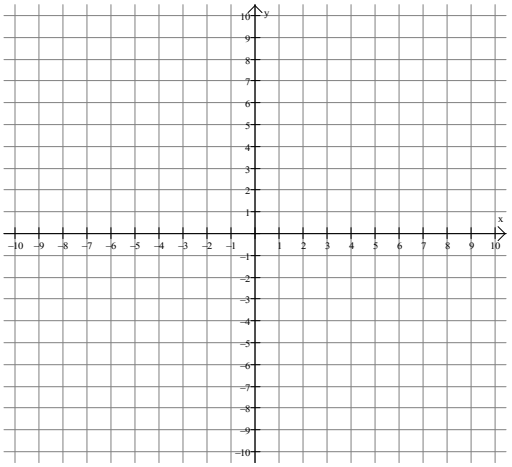
   (c) Find $g(1)$.

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

   (e) Find $g(4)$.

2. Solve for x: $7(x + 1) - 2 = 2x - 3$

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



4. Solve $|x + 1| = 7x - 9$ and check your answers.

5. Solve $|4x - 8| < 7$.

6. Solve $|3x + 4| > 2$.

7. In a controlled lab environment, some organisms exhibit constant growth over a specific time period. Suppose a certain organism starts out weighing 2 mg, and grows to 2.5 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.

8. Suppose a line passes through (-5,1) and (3,4). Find the equation of this line.

9. What is the domain of the function $f(x) = \dfrac{2x}{3x - 14}$?

10. The weekly profit function for a business is $P(x) = 30x - 200$, where x is the number of customers. How many more customers must the business add if it wants to increase profits by \$900 per week?

11. Given the function $C(x) = 20x + 1500$, which describes the total cost function of producing x digital picture frames, answer the following questions. Note: In context of this situation, x is a whole number greater than or equal to 0.

    (a) What is the practical meaning of $C(0)$? Explain in a complete sentence.

    (b) Find and interpret $C(30)$.

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. Consider the function $f(x) = 4(x - 1) + 15$. Answer the questions that follow.

(a) What is $f(4)$?

(b) What is $f(0)$?

(c) What is the y-intercept of $f(x)$?

(d) Solve $f(x) = 0$.

(e) With respect to the graph of $f(x)$, what did you find in part(d) of this question? We are looking for a specific term related to graphing functions.

14. The revenue function for selling x juicers is given by $R(x) = 98x$, where $R(x)$ is in dollars. What is the marginal revenue for this situation?

15. Find M if $x = 2$ is a solution for $Mx + 9 = 2x + 4M$.

16. A vehicle depreciates in value linearly. If the initial value of the vehicle is $\$36,000$, and the value 20 years later is $\$0$, answer the following questions.

    (a) Find a linear function that gives the value of the car after t years.

    (b) When will the car be worth $\$27,000$?