

Midterm Examination I

MAT104 Section F401

February 26th, 2013. 4:00PM–5:40PM

Instructions: Print your name on the exam booklet. This exam is closed-book and closed-note. You cannot use any electronic device in this exam. You are not allowed to talk to other students. Write all details explicitly. Answers without justifications and/or calculation steps may receive no score.

Part I

1. Solve the following first-order inequality. Write your solution in set-builder notation.

$$6x + 5 \geq x - 10.$$

2. Solve the following first-order inequality. Write your solution in interval notation.

$$\frac{2-x}{4} - \frac{3}{8} \geq \frac{2}{5}x$$

3. If $g(x) = 2x^2 - 4x + 1$, find the value of $g(-2)$.
4. If $r(s) = 3 - 6s - 3s^2$, find the value of $r(-2)$. *Hint:* What is the independent variable?
5. Find the equation of the line that contains the point $(3, 2)$ and is parallel to the line $3x + y = -3$.
6. Find the equation of the line that contains the point $(2, -5)$ and is perpendicular to the line $y = \frac{5}{2}x - 4$.

Part II

7. Solve the following first order equation:

$$\frac{3}{4} = \frac{1}{12}x + 2.$$

8. The sum of three consecutive even integers is 84. Find the integers.
9. The width of a rectangle is 25% of the length. The perimeter is 250cm. Find the length and width of the rectangle.
10. Solve the following compound inequality. Write the solution set in interval notation.

$$4x + 1 < 5 \text{ and } 4x + 7 > -1$$

11. Given $f(x) = 3x + 1$, find a number c in the domain of f such that $f(c) = -8$. Write the corresponding ordered pair of the function.

12. Find the x - and y -intercepts and graph the following function:

$$3x + 2y = 4.$$

13. Find the slope of the line containing the points P_1 and P_2 : $P_1(4, 1)$, $P_2(-1, -2)$.

14. Find the equation of the line that contains the given points: $P_1(0, -3)$, $P_2(-4, 5)$.

15. Solve the following system of first-order equations:

$$3x + y = 4$$

$$x + y = 2.$$