Math 103
Exam #1
Summer '09

Name:

1. [10 pts. each] Solve each equation. If an equation is an identity or contradiction, be sure to state its solution set.

   (a) $2(3x-5) = -4x+9+7x+1$

   (b) $9-3(2-2x) = 3+2[4-(x+1)]$

   (c) $3x+7 = 3(x+4)-10$

2. [15 pts. each] Solve each inequality. State the solution set in interval notation and make a number line graph.

   (a) $4x+1 \leq -31$

   (b) $\frac{7}{5}(10m-1) < \frac{2}{3}(6m+5)$

   (c) $-16 < 3t+2 \leq -10$

3. [10 pts.] Solve for r: $2k+ar = r-3y$

4. [5 pts.] Translate into a mathematical expression: *12 increased by four times a number.*

5. [15 pts.] The Bermuda Triangle has a perimeter of 3075 miles. The shortest side measures 75 miles less than the middle side, and the longest side measures 375 miles more than the middle side. Find the lengths of the three sides.

6. [15 pts.] At the end of a day, Dilbert found that the total cash register receipts at the motel where he works amounted to \$2725. This included the 7.5% sales tax charged. Find the amount of the tax. (Round to the nearest cent.)

7. [15 pts.] How many liters of a 14% alcohol solution must be mixed with 20 L of a 50% solution to get a 30% solution?

8. [10 pts. each] For each compound inequality, give the solution set in both interval and graph form.

   (a) $x+5 \leq 11$ and $x-3 \geq -1$

   (b) $3x < x+12$ and $x+1 > 10$

9. [15 pts.] For $x-3y=6$, find the x- and y-intercepts, then graph the equation.

10. [10 pts.] Find the midpoint of the segment with the endpoints $\left(-\frac{1}{2}, \frac{1}{3}\right)$ and $\left(\frac{3}{2}, \frac{5}{3}\right)$.