Math 103
Fall 2013
Exam 1

Name:

1. [10 pts. each] Solve each equation.

   (a) $-3s + 5s - 8 + 7 = 6s - 5$

   (b) $2x + 3(x - 4) = 2(x - 3)$

2. [10 pts.] Solve for h: $S = 2\pi rh + 2\pi r^2$.

3. [10 pts.] In a triangle with two sides of equal length, the third side measures 15 cm less than the sum of the two equal sides. The perimeter of the triangle is 53 cm. Find the lengths of the three sides.

4. [15 pts.] Montgomery Shillinggrubber invested a certain amount of money at 5.5% interest, and $4000 less than that amount at 4% interest. Determine how much was invested at each rate if the total interest earned is $1900. Round to the nearest penny.

5. [15 pts.] How much pure dye must be added to 5 gallons of a 25% dye solution to increase the solution's concentration to 40%?

6. [10 pts. each] Solve each inequality, then state the solution set in interval notation. Also graph the solution set.

   (a) $2 - 3x < -25$

   (b) $-11 \leq 2t - 5 \leq 7$

7. [10 pts. each] Solve each compound inequality, then state the solution set in interval notation.

   (a) $x + 5 \leq 20$ and $x - 3 \geq -10$

   (b) $4x < x + 24$ or $2x - 1 > 19$

8. [10 pts.] Solve the absolute value equation $|7 - 3x| = 16$.

9. [10 pts. each] Solve each absolute value inequality, then state the solution set in interval notation.

   (a) $|3r - 1| > 11$

   (b) $|y + 5| - 6 \leq -1$

   (c) $|z - 2| < -5$

10. [10 pts.] Find the x- and y-intercepts for $5x + 2y = 10$, then graph the equation.

11. [10 pts.] Find the midpoint of the segment with the endpoints $(2, -3)$ and $(6, -8)$.

12. [10 pts.] Determine whether the lines given by $2x = y + 3$ and $2y + x = 3$ are parallel, perpendicular, or neither.

13. [10 pts.] Find an equation of the line containing the points $(-2, 6)$ and $(-8, 10)$. Write the equation in standard form and also in slope-intercept form.

14. [10 pts.] Find an equation of the line through $(-2, -3)$ and parallel to $4x - y = 7$. Write the equation in standard form and also in slope-intercept form.

15. [10 pts. each] Simplify each, writing the answer with only positive exponents.

   (a) $2p^{-3}$

   (b) $(v^5)^{-4}v^8$

   (c) $\dfrac{(2k)^2 m^{-6}}{(km)^{-3}}$