

## Math 150 Week in Review 2 Problem Set

(Parts of problems 1, 5, and 10 were taken from *Precalculus: Functions and Graphs* by Swokowski/Cole)

1. Solve the following equation for the variable  $h$ :  $S = 2(lw + hw + hl)$
2. Solve the following equations.
  - (a)  $4x^2 + 24x + 1 = 0$
  - (b)  $\sqrt{52 - 6x} + 6 = x$
  - (c)  $|4x - 10| = 2$
  - (d)  $\frac{2}{x + 4} - \frac{x}{x - 2} = 3$
  - (e)  $x^{1/2} - 2x^{1/4} - 3 = 0$
3. How many real solutions do the following quadratic equations have?
  - (a)  $-2x^2 + 5x - 7 = 0$
  - (b)  $-3x^2 - 6x + 4 = 0$
4. Kristina and Matt are putting together a puzzle. It would take Matt 5 hours more than Kristina to put the puzzle together by himself. Together, they can put the puzzle together in 6 hours. How long does it take Kristina to put it together by herself?
5. I have a 20 ounce bottle of lemonade that is 60% real lemon juice. How much water should I add to the bottle to reduce the concentration of real lemon juice to 50%?
6. A farmer plans to fence off a large rectangular lot and then further fence off 4 pens of equal size inside the lot. If the area of the lot is  $96 \text{ ft}^2$  and the farmer uses 60 ft of fencing, find the dimensions of the lot.
7. Two cars leave a parking lot at the same time. One heads due west and the other heads due south. The car heading west is going 2 mph faster than the car heading south. After 1.5 hours they will be 15 miles apart. How fast is the car heading south going?
8. Solve the following inequalities:
  - (a)  $2| -11 - 7x| - 2 > 10$
  - (b)  $|5x - 2| \leq 8$
  - (c)  $\frac{3x + 5}{2 - x} < 4$
  - (d)  $\frac{x}{2x - 1} \geq \frac{3}{x + 2}$
9. Shade the region in the Cartesian plane given by the set  $\{(x, y) \mid -3 < x \leq 4, |y| > 2\}$
10. Verify that a triangle with the following vertices is a right triangle and find its area:  $A(8, 5)$ ,  $B(1, -2)$ , and  $C(-3, 2)$ .
11. Find the  $x$  and  $y$ -intercepts of the following graphs and test for symmetry.
  - (a)  $x^3 + y = 8$
  - (b)  $y = |3x| + 4$

(c)  $x = y^5 - 4y^3$

12. Find the equation of the circle that:

(a) has center  $(5, -6)$  and radius 12.

(b) has a diameter with endpoints  $(5, -2)$  and  $(7, 6)$ .

13. Find the center and radius of the circle  $2x^2 + 2y^2 - 6x + 5y = 1$ .

14. Solve the following graphically.

(a)  $x^2 + \sqrt{x^4 + 5} = x^3 - 7x$

(b)  $-0.58x \leq 0.87x - 5x^{1/3}$