MA 241
Homework #6
Due Tuesday, October 13, in class

The numbered problems come from *Stretching and Shrinking*.

1. p. 63, #8.
2. p. 64, #9–14.
3. p. 65, #21.
4. p. 65, #22.
5. p. 68, #25.
6. p. 72, #36.
7. p. 72, #37.
8. p. 73, #43.
9. p. 76, #51.
10. p. 93, #13.
11. p. 93, #14.
12. p. 94, #18.
13. p. 97, #34
14. p. 100, #42.
15. Use your answer to part (b) in the previous problem to calculate the exact value of x (not a decimal approximation) assuming that $y = 1$.
16. p. 102, #46–47.
17. p. 103, #50.
18. p. 103, #51.

19. (I am asking this problem again since I made some typos last time.) Suppose I have a polygon P and also four real numbers a, b, c, d, and I choose to make a new polygon Q by replacing each vertex (x, y) with a new point $(ax + b, cy + d)$.

    (a) Under what conditions on the numbers a, b, c, d will the resulting polygon Q be similar to P? Explain your answer. Include examples.

    (b) In the cases that the resulting polygon is in fact similar, what is the scale factor from P to Q?

20. Suppose I have a polygon P and and I choose to make a new polygon Q by replacing each vertex (x, y) with a new point $(x - y, x + y)$.

    (a) Draw an example of a scalene triangle on graph paper and draw the result of applying this rule.

    (b) Draw an example of a nonsquare rectangle on graph paper and draw the result of applying this rule.

    (c) It is a fact that Q is similar to P using this rule. What is the exact scale factor from P to Q (do not provide a decimal approximation)?