Chaos Review

1. List and define at least 20 new vocabulary terms from this unit.

2. For the iteration rule $x \to \frac{7}{8}x - 3$ and the seed $x_0 = .17$, find x_2, x_{11}, and x_{23} correct to 4 decimal places.

3. For the iteration rule $x \to \frac{7}{8}x - 3$, describe the orbit of $x_0 = .17$

4. For the iteration rule $x \to \frac{7}{8}x - 3$, describe the fate of the orbit of $x_0 = .17$

5. Sketch the time series graph for the iteration rule $x \to \frac{7}{8}x - 3$ and the seed $x_0 = .17$

6. Sketch the (approximate) web diagram for the iteration rule $x \to \frac{7}{8}x - 3$ and the seed $x_0 = .17$

7. Can you find the: iteration/web diagram/time series graph from any one of: iteration/web diagram/time series graph?

8. Find the fixed point(s) for these rules by algebra and iteration:

   (a) $x \to \frac{2}{3}x + 5$

   (b) $x \to 3.8x(1-x)$

   (c) $x \to x^2 + 2x - 3$

9. Sketch an (approximate) example of graphical iteration that indicates:

   (d) a 4-cycle

   (e) an attracting fixed point

   (f) a repelling fixed point

   (g) chaos

10. Graph the 1st iteration, 2nd iteration, and 3rd iteration for some rule that includes fixed points, 2-cycles, and 3-cycles and explain how you know they exist from the graphs.

11. Sketch (briefly) and label the orbit diagram for logistic iteration.

12. Have you looked over our past assignments to see the new vocabulary we've used, the types of questions you have been asked, and the kinds of conclusions you can be expected to draw?