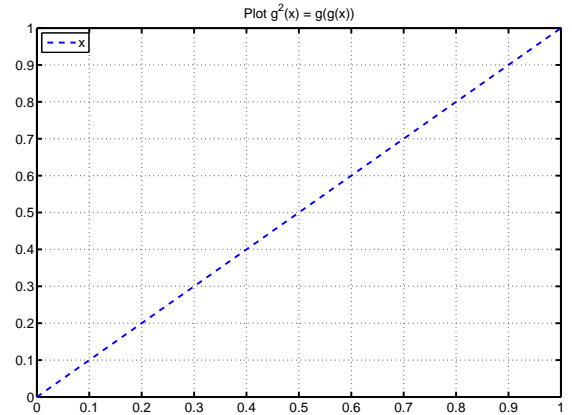
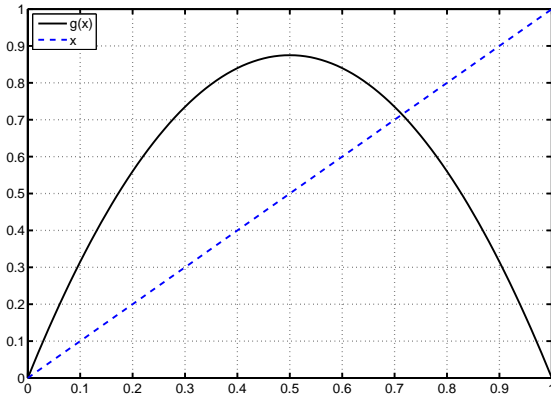


Worksheet #2: Periodic sinks and sources

Consider the function $g(x) = \frac{7}{2}x(1-x)$ ie. a logistic function with $a = \frac{5}{7}$. $x = \frac{7}{2}$ is a fixed point of $g^2(x)$.



- (1) Is there a 2-periodic orbit of g ? If so, what is the orbit?

- (2) How many fixed points does g^2 have, at least?

- (3) Is $p_1 = \frac{3}{7}$ a periodic sink, source or can you not tell?

- (4) Is p_2 also a period-2 sink, source or can you not tell? Does this answer agree with p_1 ? Explain.

- (5) Generalize the derivative test: If $\{p_1, \dots, p_k\}$ is a periodic- k orbit of f , what is $(f^k)'$ at $x = p_1$ in terms of f' ? [Hint: Use induction.]

(6) Does the test care which p_i you evaluate $(f^k)'$ at?