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## Period-2

We say that  $x_1$  and  $x_2$  are a period-2 cycle of a one-dimensional map  $f(x)$  if

$$x_2 = f(x_1) \text{ and } x_1 = f(x_2), \text{ and } x_1 \neq x_2.$$

Determine the period-2 cycle for the logistic map by solving the equation  $x = f(f(x))$ , with  $f(x) = rx(1 - x)$ . You will obtain a fourth-degree polynomial equation. Solve it by factoring out the known roots  $x = 0$  and  $x = 1 - 1/r$ .

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