

(Math 170) Homework 10:

Due December 6, 2007

- (1) Let $R_{n+1} = R_n^2 + 3R_n - 1$ be a mathematical model with $R_0 = 1$. What is R_3 ?
- (2) Let $R'_{n+1} = 3(R'_n)^3 - 11R'_n$ be a mathematical model. How many equilibrium points does R'_n have and what are they?
- (3) What is 21 base 10 expressed in base 3?
- (4) What is 121.1 base 3 expressed in base 10?
- (5) Consider the mathematical model $M_{n+1} = M_n^2 + (1 - 2i)$ with $M_0 = 0$. What is M_3 ?
- (6) What are the values of x such that $x^2 + 3x + 3 = 0$?
- (7) What does $(3 + 2i) \times (1 + i)$ equal? What about $(3 + 2i) + (1 + i)$?
- (8) Let $M_{n+1} = (M_n)^2 + 4$ be a mathematical model. How many real equilibrium points does M_n have? What (if any) are they? How many other complex equilibrium points does M_n have? What (if any) are they?
- (9) Which of the following pairs of functions are inverses of each other?
 - $f(x) = 3x + 6, g(y) = y/3 - 2$
 - $f(x) = 3x + 4, g(y) = (y + 4)/3$
 - $f(x) = 2x - 4, g(y) = y/2 - 2$

$$- f(x) = 3x + 8, g(y) = y/3 - 3$$

(10) What is $\log_6(7)$ to three decimal places?

(11) Consider the infinite sum

$$9 - 3 + 1 - \frac{1}{3} + \frac{1}{9} + \dots$$

Does it converge to a real number? If so what is the number?

(12) Consider the infinite sum

$$\frac{1}{2} - \frac{2}{3} + \frac{8}{9} + \dots$$

Does it converge to a real number? If so what is the number?