Practice Final 2 for Math 170 (Fall 2007)

(Math 170) Practice Final 2:

(1) Let $R_{n+1} = R_n^2 + 4R_n - 2$ be a mathematical model with $R_0 = 1$. What is R_3?

(2) Let $R'_{n+1} = (R'_n)^3 - 3R'_n$ be a mathematical model. How many equilibrium points does R'_n have and what are they?

(3) What is 26 base 10 expressed in base 5?

(4) What is 212.2 base 3 expressed in base 10?

(5) Consider the mathematical model $M_{n+1} = M_n^2 + (3 - i)$ with $M_0 = 0$. What is M_3?

(6) What are the values of x such that $x^2 + 2x + 4 = 0$?

(7) What does $(1 - 2i) \times (1 + 2i)$ equal? What about $(1 - 2i) + (1 + 2i)$?

(8) Let $M_{n+1} = (M_n)^2 - 5$ 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?

- $f(x) = 2x + 8$, $g(y) = y/2 + 4$
- $f(x) = 3x + 6$, $g(y) = y/3 - 3$
- $f(x) = 4x + 4$, $g(y) = y/2 - 2$

– $f(x) = 5x + 2$, $g(y) = (y - 5)/2$

(10) What is $\log_6(5)$ to three decimal places?

(11) Consider the infinite sum

$$7 + \frac{14}{3} + \frac{28}{9} + \dots$$

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

(12) Consider the infinite sum

$$\frac{1}{7} + \frac{3}{14} + \frac{9}{28} + \dots$$

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