Math 170

Practice Final Exam 3

Name _____ Section Number _____

(1) Suppose A is a symbol which represents ten and B is a symbol which represents eleven. What is AAA base 11 expressed base 6?

(2) What is 555.55 base 6 expressed base 10?

(3) What is $123.\overline{123}$ base 5 as a fraction (base 10) in lowest terms?

(4) What is $[3; 5, 3, 5, 8]$ expressed as a fraction in lowest terms?

(5) What does $[3; \overline{5, 3}]$ equal?

(6) Which of the following are rational numbers?

(i) $\sqrt{2^4 \cdot 3^5 \cdot 11^6}$

(ii) $\sqrt[3]{2^3 \cdot 5^6 \cdot 13^{12}}$

(iii) $\sqrt[6]{2^2 \cdot 11^{11} \cdot 13^{13}}$

(iv) $\sqrt[5]{2^{10} \cdot 5^5 \cdot 23^{25}}$

(7) Let $R_{n+1} = 2R_n^2 - 2R_n - 2$ be a mathematical model with $R_0 = 0$. What is R_3?

(8) Let $R'_{n+1} = 2(R'_n)^3 - 17R'_n$ be a mathematical model. How many equilibrium points does R'_n have and what are they?

(9) Consider the mathematical model $M_{n+1} = M_n^2 + (2 - 4i)$ with $M_0 = 0$. What is M_3?

(10) What are the values of x such that $2x^2 - 5x + 2 = 0$?

(11) What does $(1 + 2i) \times (12 - 5i)$ equal? What about $(1 + 2i) + (12 - 5i)$?

(12) What does $\frac{6+3i}{5+i}$ equal? What about $(6+3i)-(5+i)$?

(13) 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?

(14) Let $F_1 = 1$, $F_2 = 1$ and $F_{n+2} = F_{n+1} + F_n$ describe the Fibonacci numbers. What does $F_5 + F_8 + F_{11}$ equal?