Math 170

Practice Final Exam 2

Name _____ Section Number _____

(1) Suppose $A$ is a symbol which represents ten and $B$ is a symbol which represents eleven. What is $A3B$ base 12 expressed base 4?

(2) What is 443.21 base 5 expressed base 10?

(3) What is $323.\overline{323}$ base 4 as a fraction (base 10) in lowest terms?

(4) What is $[6; 4, 6, 4, 6]$ expressed as a fraction in lowest terms?

(5) What does $[2; \overline{5, 2}]$ equal?

(6) Which of the following are rational numbers?

(i) $\sqrt{2^4 \cdot 3^6 \cdot 5^{10}}$

(ii) $\sqrt[4]{2^6 \cdot 5^4 \cdot 13^{12}}$

(iii) $\sqrt[3]{2^2 \cdot 3^5 \cdot 7^8}$

(iv) $\sqrt[5]{2^5 \cdot 3^{15} \cdot 13^5}$

(7) Let $R_{n+1} = R_n^2 - 2R_n + 3$ be a mathematical model with $R_0 = 0$. What is $R_3$?

(8) Let $R'_{n+1} = 3(R'_n)^3 - 26R'_n$ 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 $2x^2 - 3x + 5 = 0$?

(11) What does $(3 + 5i) \times (2 - 4i)$ equal? What about $(3 + 5i) + (2 - 4i)$?

(12) What does $\frac{-4+4i}{2+3i}$ equal? What about $(-5-4i)-(2+3i)$?

(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 $F_3 + F_8 + F_{10}$ equal?