Algebra II Chapter 10 Test Mr. Pleacher Name _____

I. Multiple Choice

_____ 1. Which of the following represents the quotient of $\left(x^6-2x^4+3x^3-4x^2+x-8\right)\div\left(x+2\right)$?

A. $x^5-2x^4-6x^3-9x^2-22x-43-\frac{94}{x+2}$

B. $x^5-2x^4+2x^3-x^2-2x+5+\frac{2}{x+2}$

C. $x^5-2x^4+2x^3-x^2-2x+5-\frac{18}{x+2}$

D. $x^5-4x^3+11x^2-26x+53+\frac{98}{x+2}$

_____ 2. Which of the following could be used to perform the synthetic division for $\left(x^3+7x^4-x+6x^2-8\right)\div\left(x-3\right)$

A. $3\overline{)\begin{array}{cccccc}1 & 7 & -1 & 6 & -8 & \\ & & & & & \end{array}}$

B. $-3\overline{)\begin{array}{cccccc}1 & 7 & -1 & 6 & -8 & \\ & & & & & \end{array}}$

C. $3\overline{)\begin{array}{cccccc}7 & 6 & 1 & -1 & -8 & \\ & & & & & \end{array}}$

D. $3\overline{)\begin{array}{cccccc}7 & 1 & 6 & -1 & -8 & \\ & & & & & \end{array}}$

_____ 3. Which is the remainder when $\left(x^5-2x^4+3x^3-2x^2+4x-6\right)$ is divided by $\left(x+2\right)$?

A. 30 B. -110 C. -2 D. -72

II. Long Division

Perform the following long division problems using ANY method:
SHOW ALL WORK.

4. $\left(2m^3 + 7m^2 - m + 8\right) \div \left(m + 3\right)$

5. $\left(m^4 - 2m^2 + 3m - 4\right) \div \left(m + 1\right)$

6. $\left(4r^3 - 2r^2 - 2r + 1\right) \div \left(2r - 1\right)$

III. The first polynomial is a factor of the second polynomial.
Show **ALL** the linear factors of the second polynomial.

7. $2x-3;\quad 2x^3-9x^2+x+12$

8. $x+4;\quad 6x^3+37x^2+47x-20$

IV. Write out all the ***possible*** rational solutions for each equation.

_____ 9. $2x^3-4x^2+7x-8=0$

_____ 10. $x^4-3x^2+2x+5=0$

V. Solve the following equations over the set of complex numbers:

11. Solve for x: $x^3+1=0$

12. Solve for x: $x^3+3x^2-4=0$

VI. Miscellaneous

13. Two of the solutions of $x^4 - 2x^3 + 3x^2 + 2x + 2 = 0$ are i and $-1 + i$.
How many other solutions are there and what are they?

14. One solution of $x^3 + 4x^2 - 22x + 3 = 0$ is $\frac{-7 + \sqrt{53}}{2}$.
Find the other solutions.

Extra Credit:

Given the solutions of an equation are $x = 2$, $x = -1$, and $x = \frac{2}{3}$,
Determine the equation in standard form (with integral coefficients).