Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Algebra II

Score: \_\_\_\_\_\_ / 25

Period: \_\_\_\_\_\_\_\_\_\_\_\_\_ **Cumulative Review #2.2**

***Directions:*** Show all work in order to receive full credit. A correct answer with no supporting work will only receive one credit. Be sure to show all appropriate formulas and formula substitutions as part of your work.

1. Algebraically determine the roots, in simplest $a+bi$ form, to the equation below.

$$x²-2x+7=4x-10$$

1. Which description could represent the graph of $f(x)=4x²(x+a)-x-a$, if $a$ in an integer? **[Explain your answer/Show work for full credit]**
	1. As $x\rightarrow -\infty $, $f(x)\rightarrow \infty $, as $x\rightarrow \infty $, $f(x)\rightarrow \infty $, and the graph has *3* x-intercepts.
	2. As $x\rightarrow -\infty $, $f\left(x\right)\rightarrow -\infty $, as $x\rightarrow \infty $, $f(x)\rightarrow \infty $, and the graph has *3* x-intercepts.
	3. As $x\rightarrow -\infty $, $f(x)\rightarrow \infty $, as $x\rightarrow \infty $, $f\left(x\right)\rightarrow -\infty $, and the graph has *4* x-intercepts.
	4. As $x\rightarrow -\infty $, $f\left(x\right)\rightarrow -\infty $, as $x\rightarrow \infty $, $f(x)\rightarrow \infty $, and the graph has *4* x-intercepts.
2. The completely factored form of $n^{4}-9n^{2}+4n^{3}-36n-12n^{2}+108$ is **[show all work]**
	1. $(n²-9)(n+6)(n-2)$
	2. $(n+3)(n-3)(n+6)(n-2)$
	3. $(n-3)(n-3)(n+6)(n-2)$
	4. $(n+3)(n-3)(n-6)(n+2)$
3. Evan graphed a cubic function, $f\left(x\right)=ax^{3}+bx^{2}+cx+d$, and determined the roots of $f(x)$ to be $\pm 1$ and $2$. What is value of $b$, if $a=1$? **[show all work]**
	1. $1$
	2. $2$
	3. $-1$
	4. $-2$
4. Determine for which polynomial(s) $(x+2)$ is a factor. Explain your answer.

$$P\left(x\right)=x^{4}-3x^{3}-16x-12$$

$$Q\left(x\right)=x^{3}-3x^{2}-16x-12$$