MA 114 - Reading Assignment 16 - Section 3.6 - Spring 2008

The one, the only _____!

1. If we divide $f(x)$ by $g(x)$ to get $f(x) = q(x)\,g(x) + r(x)$, then $f(x)$ is called the _____, $q(x)$ is called the _____, $g(x)$ is called the _____, and $r(x)$ is called the _____.

2. Follow Example 1. Find the remainder if $f(x) = x^2 + 3x - 1$ is divided by $x - 2$.

3. Follow Example 2. Is $x - 2$ a factor of $f(x) = x^2 + 3x - 1$? Why or why not?

4. A polynomial of degree n has at most how many zeros? _____

5. **True** or **False**: Let $f(x) = a_n x^n + a_{n-1}x^{n-1} + \cdots + a_1 x + a_0$, where each coefficient is an integer. If $\frac{p}{q}$ is a rational zero of f, then p must be a factor of a_n, and q must be a factor of a_0.

6. A polynomial like $x^2 + 1$ is called _____ because it cannot be factored over the real numbers.

7. We call a number M a _____ on the zeros of a polynomial if every zero of the polynomial lies between $-M$ and M.

8. Let $f(x) = x^3 + x - 3$. We see $f(0) = -3$ and $f(2) = 7$. Since $f(0)$ and $f(2)$ have opposite signs, what theorem guarantees that $f(x)$ has at least one zero between 0 and 2?