

Quiz #6 11/20/09

Name: _____

Directions: Make sure to read each problem carefully. To receive full credit, you must show all of your work.

Problem 1. (3 points) Find the quotient (q) and remainder (r), when $a = -47$ is divided by $b = 7$.

Problem 2. (5 points) Prove (using induction) that for all $n \in \mathbb{Z}^+$,

$$\sum_{i=1}^n i(i+1) = \frac{n(n+1)(n+2)}{3}$$

Problem 3. (3 points) If the sequence $\{a_n\}$ is explicitly defined by

$$a_n = 2^n - 1$$

then define a_n recursively (i.e. in terms of a_{n-1} and not n).

Problem 4. (5 points) Prove that if n is odd, then $8|(n^2 - 1)$.