Team Name:

Instructions

<u>Only one sheet per team will be turned in.</u> Each team member can work on their own sheet for practice, but then the group as a whole should discuss the answers and collaborate on the turn-in sheet. Everyone can take home their own sheets.

Team Info (only fill out for the sheet to be turned in)

Team Name:

Group members (up to four):

2.

3.

1.

4.

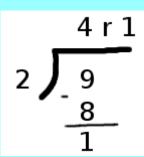
Introduction 1

Modulus is a mathematical operation where the result is the *remainder* of a division.

For example, 9/2 = 4.5 (or, 4 + 1/2)

If we did integer division (meaning no remainder), 9 / 2 = 4. Then, if we do 9 mod 2, the result of that is 1.

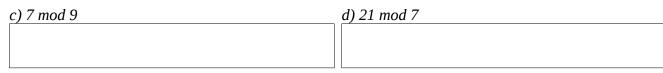
In general terms, $a \mod b = r$, and $a = b \cdot q + r$



Question 1

Calculate the following. Also express $a=b\cdot q+r$, where $0 \le r < b$; r is the answer.

a) 13 mod 5	$(13=5\cdot q+r)$	b) -19 mod 3	



Introduction 2

A <u>counterexample</u> is a way to disprove a proposition. For implications, if we can come up with *some hypothesis* that results in the *conclusion* being false, then we can disprove a statement.

In Practice Problem 4 from book, the statement is made...:

For every integer $n \ge 1$, if n is odd, then $n^2 + 4$ is a prime number.

Several examples given don't disprove this statement:

$$3^2+4=13$$
 , $5^2+4=29$, $7^2+4=53$

But as long as at least one can be found, then we can use this as a counterexample to disprove it: $9^2+4=85$, 85 is divisible by 5 and 17.

Question 2

Prove the following: If <i>n</i> is odd, then $n^2 + 2n$ is odd.				