Name: _____

Directions: Show all work. No credit for answers without work.

1. [**1 point**] Determine whether the following statements are true or false. Write the entire word "true" or the entire word "false".

   (a) $15 \equiv 9 \pmod 6$

   (b) $6 \equiv -24 \pmod{10}$

   (c) $13 \equiv -6 \pmod 7$

2. [**2 points**] Fill in the blanks: an integer n is odd if and only if n is congruent to _____ modulo _____ .

3. [**3 points**] For which positive integers m is it true that $17 \equiv 37 \pmod m$?

4. [**4 points**] Let a, b, and c be integers, and let m be a positive integer. Prove that if $a \equiv b \pmod m$ and $b \equiv c \pmod m$, then $a \equiv c \pmod m$.