Name: _____

1. [**2.5 points**] Verify the correctness of the following program segment.

$\{x \leq y\}$
if $y > 10$ then
   $x = 4$
else
   $y = 12$
end if
$\{x \leq 10\}$

2. [**2.5 points**] The loop inference rule of program correctness only ensures that the loop statement is "partially correct". Which crucial property of a working program is not guaranteed by the loop inference rule?

3. [**2.5 points**] Use Euclid's algorithm to compute $\gcd(15708, 1870)$. You may use a calculator for arithmetic, but show all other work involved in executing the algorithm.

4. [**2.5 points**] Use induction to prove that $\dfrac{1}{1 \cdot 2} + \dfrac{1}{2 \cdot 3} + \dfrac{1}{3 \cdot 4} + \cdots + \dfrac{1}{n \cdot (n+1)} = \dfrac{n}{n+1}$ for every positive integer n.