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CSI30

Quiz 3 Sample

Instructions

Solve all problems and mark your answers clearly. Show all work, using additional paper if needed. Each problem is worth the points indicated.

1. (10) Evaluate: $28 \bmod 5 =$, $28 \operatorname{div} 5 =$.
2. (10) Evaluate: $(-17) \bmod 4 =$, $(-17) \operatorname{div} 4 =$
3. (10) Find the prime factorization of 96.
4. (10) Find the prime factorization of 119.
5. (10) Evaluate $11 +_{12} 7$, $3 \cdot_6 5$.
6. (50) The *Euclidean Algorithm*, with each step numbered to allow a description of its performance, is given below. It returns the gcd of a and b . Give a history of the algorithm as it calculates the gcd of 45 and 165. To do this, make a table where each row gives the variable values at the end of each loop repetition (after steps 4,5 and 6). Circle the value that is finally returned.

procedure GCD(a, b : positive integers)

- (1) $x := a$
- (2) $y := b$
- (3) **while** $y \neq 0$
- (4) $r := x \bmod y$
- (5) $x := y$
- (6) $y := r$
- (7) **return** x