

Homework Assignment # 4

Due: 2003-10-06

Problems: Compute the following:

$$1. \left[\sum_{i=1}^{29} i \right] - \left[\sum_{i=1}^{28} i \right]$$

$$2. \left[\sum_{i=1}^{32} \log_2 i \right] - \left[\sum_{i=1}^{31} \log_2 i \right]$$

$$3. \left[\sum_{i=1}^{13} (i!) \right] - \left[\sum_{i=3}^{13} (i!) \right]$$

$$4. \text{ Let } f(x) = (3x - 1), \text{ and compute } \left[\sum_{i=1}^5 f(i+1) \right] - \left[\sum_{i=1}^5 f(i) \right]$$

$$5. \text{ Let } f(x) = (x - 29)(x - 30), \text{ and compute } \left[\sum_{i=1}^{31} f(i) \right] - \left[\sum_{i=1}^{28} f(i) \right].$$

$$6. \text{ Let } f(x) = (x - 29)(x - 30), \text{ and compute } \left[\sum_{i=1}^{31} f(i) \right] - \left[\sum_{i=4}^{33} f(i-3) \right].$$

For the remainder of the questions, let $S(n)$ be the statement “ $2^n + 2n + 1$ is prime.”

7. Then

- (a) $S(k)$ is the statement _____.
- (b) $S(k + 1)$ is the statement _____.
- (c) $S(3)$ is the statement _____.

8. Is $\forall n S(n)$ true or false?

9. Is $S(5)$ true or false?