CS114

1. Calculate the following sums:

(a) $\sum_{i=1}^{5} (20) = 20(5) = 100$

(b) $\sum_{K=0}^{5} = 20(6) = 120$

(c) $\sum_{j=1}^{14} = (j) \quad \frac{14(14+1)}{2} = \frac{210}{2} = 105$

(d) $\sum_{j=6}^{14} = (j) = \frac{14(15)}{2} - \frac{5(6)}{2} = 90$

(e) $\sum_{j=2}^{7} (2j) = 2\left(\frac{7(8)}{2}\right) - 2(1) = 54$

(f) $\sum_{j=3}^{7} (5j+1) = 5\left(\frac{7(8)}{2} - \frac{3(2)}{2}\right) + 1(7-3+1) = 130$

(g) $\sum_{j=0}^{11} (2^j) = 4095$

(h) $\sum_{j=1}^{11} (2^j) = 4094$

2. Polynomials

(a) Degree = 4

$a0 = 0$

$a1 = 2$

$a2 = 0$

(b) Degree = 6

$a0 = 19$

$a1 = 3$

$a2 = 0$

(c) Degree = 0

$a0 = 5$

$a1 = 0$

$a2 = 0$

(d) Degree = 1

$a0 = 1$

$a1 = 2$

$a2 = 0$

3. Simplify Powers

(a) 2^{x+y} (b) 2^{x-y} (c) 1 (d) $\left(\frac{1}{2}\right)^x$

(e) $\sqrt[x]{2}$

5. Simplify radicals

(a) $\log_2 A + \log_2 B$

(b) $\log_2(1) - \log_2(A)$

(c) 1

(d) x

(e) 2

6. More radicals with $(+, -, *, \div)$

(a) $\log_2 x - \log_2 y$

(b) $\log_2 5 + \log_2 x - (\log_2 3 + \log_2 y)$

(c) $6 \log_2 x$

(d) $\dfrac{\log_2(x)}{\log_2(4)}$

7. Binary to decimal

(a) 2 (b) 6 (c) 51 (d) 31 (e) 22

8. Decimal to Binary

(a) 111011 (b) 10000001111

(c) 111111