CS 278 Lab 10

8.3.1 (c) $\sum_{k=-3}^{2} k^3 = -3^3 + -2^3 + -1^3 + 0^3 + 1^3 + 2^3$

$-27 + -8 + -1 + 0 + 1 + 8 = \boxed{-27}$

(d) $\sum_{k=0}^{3} 3^k = 3^0 + 3^1 + 3^2 + 3^3 =$

$1 + 3 + 9 + 27 = \boxed{40}$

(g) $\sum_{k=0}^{100} (3 + 5k) = 3 \cdot 101 + \frac{5(100) \cdot 101}{2}$

$= 303 + 25,250 = \boxed{25,553}$

(h) $\sum_{k=0}^{100} (3 \cdot (1.1)^k) = \frac{3\left((1.1)^{101} - 1\right)}{1.1 - 1}$

$= \frac{3(15,158.674 - 1)}{0.1} = \boxed{454,730.207}$

8.3.2 (b) $-2 + -1 + 0 + 1 + 2 + 3 + 4 + 5$

$\boxed{\sum_{k=-2}^{5} (k)}$

(d) $0^3 + 1^3 + \ldots + 17^3$

$\boxed{\sum_{k=0}^{17} (k^3)}$

(e) The sum of the cubes of first 15 positive integers

$\boxed{\sum_{k=1}^{15} (k^3)}$

8.3.3 (d) $\sum_{k=0}^{m+2} (k^2 - 4k + 1)$

$= \boxed{\sum_{k=0}^{m+1} (k^2 - 4k + 1) + \left((m+2)^2 - 4(m+2) + 1\right)}$

(e) $\sum_{k=0}^{q-1} (k^2 + 4k + 3)$

$= \boxed{\sum_{k=0}^{q-2} (k^2 + 4k + 3) + \left((q-1)^2 + 4(q-1) + 3\right)}$

8.3.4 (b) $\sum_{k=0}^{n-1} \left(2^{(k-2)}\right)$, $j = k - 1$

$= \boxed{\sum_{j=-1}^{n-2} \left(2^{(j-1)}\right)}$

(d) $\sum_{j=4}^{17} (2j + 4)$, $k = j - 4$

$= \boxed{\sum_{k=0}^{13} \left(2(k+4) + 4\right)}$

(e) $\sum_{k=16}^{20} (6k - 4)$, $j = k + 5$

$= \boxed{\sum_{j=15}^{25} \left(6(j-5) - 4\right)}$

8.3.7 (a) Rabbits on farm grow 12% each year, $r_0 = 30$. Define $\{r_n\}$

- Find expression for r_{12}

$\boxed{r_{12} = 30(1.12)^{12}}$

(b) year 1 rabbits = 30 food = 30 × 10 lbs

year = 2 $r = 30(1.12)^1$ $f =$ $\times 10$

$y = 3$ $r = 30(1.12)^2$ $f =$ $\times 10$

$$\sum_{y=1}^{10} 10 \times 30(1.12)^{(y-1)}$$

$$= \frac{300\left((1.12)^{10} - 1\right)}{1.12 - 1}$$