8) 1. Paso 1) $c = 2$

Paso 2) $c = 4 = 2^2$

Paso 3) $c = 8 = 2^3$

Paso 4) $c = 16 = 2^4$

$\Rightarrow$ Paso k) $c = 2^k$

$2^k = n - 1 \longrightarrow$ (veces del while)

$\log_2(n-1) = k$

a) $T(n) = c_1 + \sum_{k=0}^{\log_2(n-1)} (c_2)$

$= c_1 + \log_2(n-1) c_2$

b) $O(\log n)$

2. Paso 1) $c = \frac{n}{2} = \frac{n}{2^1}$

Paso 2) $c = \frac{n}{4} = \frac{n}{2^2}$

Paso 3) $c = \frac{n}{8} = \frac{n}{2^3}$

$\Rightarrow$ Paso k) $c = \frac{n}{2^k}$

$\frac{n}{2^k} = 1 \longrightarrow n = 2^k$

$\log_2 n = k$

a) $T(n) = c_1 + \sum_{k=0}^{\log_2 n} (c_2) = c_1 + \log_2 n \, c_2$

b) $O(\log n)$

3. 1er For: $\sum_{i=1}^{\frac{m}{2}-1} (2\text{do For})$

2do For: $\sum_{j=1}^{i-1} (C_2)$

a) $T(m) = C_1 + \sum_{i=1}^{\frac{m}{2}-1} \left(\sum_{j=1}^{i-1} (C_2) \right) = C1 + \sum_{i=1}^{\frac{m}{2}-1} (i - 2(C_2))$

$$= C_1 + \sum_{i=1}^{\frac{m}{2}-1} i - \sum_{i=1}^{(m/2)-1} 2C_2 = C_1 + \frac{((m/2)-2)(\frac{m}{2}-1)}{2} - \left(\frac{m}{2} - 2(C_2)\right) \cdot 2^{-1}$$

$$= C_1 + \frac{(m/2)-2}{2} \cdot \frac{m-1}{4} - (m-1 - 4C_2)$$

$$= C_1 + \left(\frac{m}{4} - \frac{2}{2}\right) \cdot \frac{m-1}{4} - m-1 + 4C_2 = C_1 + \frac{m^2-1}{16} - \frac{m-1}{4} - m-1 + 4C_2$$

$$= \frac{1}{16} m^2 - 1 - \frac{1}{4} m - 1 - m - 1 + 4C_2 + C_1 = \frac{1}{16}(m^2 - 1) - \frac{1}{4}(m-1) - m + 1$$

$$+ 4C_2 + C_1 =$$

$$= \frac{1}{16} m^2 - \frac{1}{16} - \frac{1}{4} m - \frac{1}{4} - m + 1 + 4C_2 + C_1 =$$

$$= \frac{1}{16} m^2 - \frac{1}{4} m - m + 4C_2 + C_1 + \frac{11}{16}$$

b) $O(m^2)$