Recursion relation

Q1.

→ $T(n) = 3T(n-1) + 12n$

$T(2) = 3T(2-1) + (12 \times 2)$

$T(1) = 3T(1-1) + (12 \times 1)$

$T(1) = 3T(0) + 12$

$T(1) = 27$

$T(2) = 3 \times T(1) + (12 \times 2)$

$= 81 + 24$

$= 105$ //

Q2

→ a. $T(n) = T(n-1) + c$

$An + B = A(n-1) + B + c$

$An + B = An - A + B + c$

$0 = -A + c$

$A = c$

b. $T(n) = 2T(n/2) + n$

$An\log n + Bn = 2A(n/2)\log(n/2) + B(n/2) + n$

$0 = -A\log 2 + Bn/2$

$B = 2A/\log 2$

c. $T(n) = 2T(n/2) + c$

$An + B = 2A(n/2) + B + c$

$B = c$

d. $T(n) = T(n/2) + c$

$A = 2c/n$

Q3.

→ a. $T(n) = 2T(n-1) + 1$

$\Rightarrow T(n) = 2^{\log n + 1} - 1$

$= 2n - 1$

b. $T(n) = 2T(n/2) + n$

$= n \log n + n$