

$$I(N) = CP + NC^2$$

$$I(N) = C + V(C + C^2)$$

$$I(N) = C + NC^2 + NC + NC^2 + C^3$$

mathcounts

$$2 \quad \sum_{i=1}^{15} i^2 = 1^2 + 2^2 + 3^2 + 4^2 + 5^2 + 6^2 + 7^2 + 8^2 + 9^2 + 10^2 + 11^2 + 12^2 + 13^2 + 14^2 + 15^2$$

ANS = 1240

$$\frac{n(n+1)(2n+1)}{6}$$

$$\frac{15(15+1)(2 \times 15+1)}{6}$$

$$\frac{15(16)(31)}{6} = \frac{7440}{6} = 1240$$

$$3 \quad \sum_{i=0}^{10} 2^i = 2^0 + 2^1 + 2^2 + 2^3 + 2^4 + 2^5 + 2^6 + 2^7 + 2^8 + 2^9 + 2^{10}$$

~~$+ 2 + 4 + 8 + 16 + 32 + 64 + 128 + 256 + 512 + 1024$~~

ANS = 2047

$$\sum_{i=0}^n r^i = \frac{r^{n+1} - 1}{r - 1} = \frac{2^{11} - 1}{2 - 1} = \frac{2048 - 1}{1} = 2047$$

$$4 \quad \sum_{i=1}^8 2^{-i} = \frac{1}{2} + \frac{-2}{2} + \frac{-3}{2} + \frac{-4}{2} + \frac{-5}{2} + \frac{-6}{2} + \frac{-7}{2} + \frac{-8}{2}$$

~~$.5 + .25 + .125 + .0625 + .03125 + .015625 + .0078125 + .00390625$~~

ANS = 0.996 ~~0.9966666666666666~~

~~100%~~ ~~i~~

$$ANS = 0.5 \left(\frac{1 - 0.5^8}{1 - 0.5} \right) = 0.5 \left(1 - 0.0039 \right) = 1 - 0.0039 = 0.996$$

$$5 \quad \sum_{i=1}^{n-1} i = 1 + 2 + 3 + 4 + \dots + (n-1)$$

$$= \frac{(n-1)n}{2}$$