Summation Problems:

1. $\sum_{i=4}^{20}(4i-1)$

$$= \sum_{i=4}^{20} 4i - \sum_{i=4}^{20} 1$$

$$= 4 \cdot \sum_{i=4}^{20} i - \sum_{i=4}^{20} 1$$

$$= 4 \cdot \left(\sum_{i=1}^{20} i - \sum_{i=1}^{3} i\right) - \sum_{i=4}^{20} 1$$

$$= 4 \cdot \left(\frac{20(20+1)}{2} - \frac{3(3+1)}{2}\right) - 1 \cdot (20-4+1) \quad \text{(Ans)}$$

2. $\sum_{j=12}^{17}(-1)^j$

$$= \sum_{j=0}^{17}(-1)^j - \sum_{j=0}^{11}(-1)^j$$

$$= \frac{(-1)^{17+1}-1}{(-1)-1} - \frac{(-1)^{11+1}-1}{(-1)-1}$$

[Or you can directly use the alternate formula and get, $\frac{(-1)^{17+1}-(-1)^{12}}{(-1)-1}$]

(Ans)

3. $\sum_{j=\upsilon}^{\rho\pi\pi} j^2$

$$= \sum_{j=\rho}^{\rho\pi\pi} j^{\varsigma} - \sum_{j=1}^{4} j^{\varsigma}$$

$$= \frac{100(100+1)(2\cdot 100+1)}{6} - \frac{4(4+1)(2\cdot 4+1)}{6} \quad \text{(Ans)}$$