

> sum ((2^i)^2, i=0..log[2](n));

$$\frac{1}{3} 4^{\left(\frac{\ln(n)}{\ln(2)}+1\right)} - \frac{1}{3}$$

> simplify(%);

$$\frac{4n^2}{3} - \frac{1}{3}$$

> sum ((2^i)^log[2](3), i=0..log[2](n));

$$\frac{\left(2^{\left(\frac{\ln(n)}{\ln(2)}+1\right)}\right)^{\frac{\ln(3)}{\ln(2)}}}{2^{\frac{\ln(3)}{\ln(2)}-1}} - \frac{1}{2^{\frac{\ln(3)}{\ln(2)}-1}}$$

> simplify(%);

$$\frac{3}{2^n} \left(\frac{\ln(3)}{\ln(2)}\right) - \frac{1}{2}$$