> $s := \frac{(n+k-3)}{2}$

$$s := \frac{1}{2}\,n + \frac{1}{2}\,k - \frac{3}{2} \qquad \textbf{(1)}$$

> $l := s - k + 1$

$$l := \frac{1}{2}\,n - \frac{1}{2}\,k - \frac{1}{2} \qquad \textbf{(2)}$$

After having related s and l in terms of n and k,
we compute N(T) and R(T) in terms of the coefficients.
The main terms in the simplified versions are the ones with 2^l

We count
all k-cliques that are not part of the stem (there are l of them)
all subtrees (sub-k-trees) containing the whole stem; 2^(l+2) since we can add or not add any simplicial vertex independently
subtrees containing the stem, but not both endvertices
subtrees containing at least k vertices of the stem, and not both endvertices

> $N := k\cdot(n-k) + 1 - l + 2^{l+2} + 2\cdot sum(2^{i}, i = 2\,..l) + sum((l-1-i)\cdot 2^{i}, i = 1\,..\,l-2)$

$$N := k\,(n-k) - \frac{11}{2} - \frac{3}{2}\,n + \frac{3}{2}\,k + 2^{\frac{1}{2}\,n - \frac{1}{2}\,k + \frac{3}{2}} + 2\,2^{\frac{1}{2}\,n - \frac{1}{2}\,k + \frac{1}{2}} + \frac{1}{2}\,2^{\frac{1}{2}\,n - \frac{1}{2}\,k - \frac{3}{2}}\,n - \frac{1}{2}\,2^{\frac{1}{2}\,n - \frac{1}{2}\,k - \frac{3}{2}}\,k + \frac{1}{2}\,2^{\frac{1}{2}\,n - \frac{1}{2}\,k - \frac{3}{2}} - 2^{\frac{1}{2}\,n - \frac{1}{2}\,k - \frac{3}{2}}\left(\frac{1}{2}\,n - \frac{1}{2}\,k - \frac{3}{2}\right) \qquad \textbf{(3)}$$

> $simplify(N)$

$$-k^2 + k\,n + 9\,2^{\frac{1}{2}\,n - \frac{1}{2}\,k - \frac{1}{2}} + \frac{3}{2}\,k - \frac{3}{2}\,n - \frac{11}{2} \qquad \textbf{(4)}$$

This is approximately 9*2^l

We multiply with the average order.
the k-cliques have order k
the stem has order s and the l+2 k-leaves are in exactly half of the subtrees
if we take (i-1)+(k-1) consecutive vertices of the stem, there are i additional leaves (appearing on average in half of the subtrees)
i+(k-1) vertices of the stem + i/2 k-leaves on average

> $R := (k\cdot(n-k) + 1 - l)\cdot k + 2^{l+2}\cdot\left(s + \frac{(l+2)}{2}\right) + 2\cdot sum\left(2^{i}\cdot\left(\frac{i}{2} + i + k - 2\right), i = 2\,..l\right) + sum\left((l-1-i)\cdot 2^{i}\cdot\left(i + k - 1 + \frac{i}{2}\right), i = 1\,..\,l-2\right)$

$$R := \left(k\,(n-k) + \frac{3}{2} - \frac{1}{2}\,n + \frac{1}{2}\,k\right)k + 2^{\frac{1}{2}\,n - \frac{1}{2}\,k + \frac{3}{2}}\left(\frac{3}{4}\,n + \frac{1}{4}\,k - \frac{3}{4}\right) \qquad \textbf{(5)}$$

$$+2\,2^{\frac{1}{2}n-\frac{1}{2}k+\frac{1}{2}}k-10\,2^{\frac{1}{2}n-\frac{1}{2}k+\frac{1}{2}}+3\,2^{\frac{1}{2}n-\frac{1}{2}k+\frac{1}{2}}\left(\frac{1}{2}n-\frac{1}{2}k+\frac{1}{2}\right)$$
$$-\frac{19}{2}k+\frac{39}{2}+\frac{1}{2}2^{\frac{1}{2}n-\frac{1}{2}k-\frac{3}{2}}kn-2\,2^{\frac{1}{2}n-\frac{1}{2}k-\frac{3}{2}}n-\frac{1}{2}2^{\frac{1}{2}n-\frac{1}{2}k-\frac{3}{2}}k^2$$
$$+\frac{5}{2}2^{\frac{1}{2}n-\frac{1}{2}k-\frac{3}{2}}k-5\,2^{\frac{1}{2}n-\frac{1}{2}k-\frac{3}{2}}+\frac{3}{4}n\,2^{\frac{1}{2}n-\frac{1}{2}k-\frac{3}{2}}\left(\frac{1}{2}n-\frac{1}{2}k-\frac{3}{2}\right)$$
$$-\frac{7}{4}k\,2^{\frac{1}{2}n-\frac{1}{2}k-\frac{3}{2}}\left(\frac{1}{2}n-\frac{1}{2}k-\frac{3}{2}\right)+\frac{19}{4}2^{\frac{1}{2}n-\frac{1}{2}k-\frac{3}{2}}\left(\frac{1}{2}n-\frac{1}{2}k-\frac{3}{2}\right)$$
$$-\frac{3}{2}2^{\frac{1}{2}n-\frac{1}{2}k-\frac{3}{2}}\left(\frac{1}{2}n-\frac{1}{2}k-\frac{3}{2}\right)^2-kn+\frac{5}{2}n+k^2$$

> $simplify(R)$

$$-k^3+k^2n+\frac{9}{8}2^{\frac{1}{2}n-\frac{1}{2}k+\frac{1}{2}}k+\frac{27}{8}2^{\frac{1}{2}n-\frac{1}{2}k+\frac{1}{2}}n+\frac{3}{2}k^2-\frac{3}{2}kn$$
$$-\frac{111}{8}2^{\frac{1}{2}n-\frac{1}{2}k+\frac{1}{2}}-8k+\frac{5}{2}n+\frac{39}{2} \qquad \textbf{(6)}$$

Since the exponents are l+1, we can see that R is dominated by (9/4k+27/4n-111/4) 2^l

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