Problem 58

Simplify: $2^{\log_3 \binom{8}{\log_2(9)}}$

Answer

$\boxed{64}$

Explanation

Bringing $\log_2(9)$ in front of the $\log_3(8)$ yields $2^{\log_2(9)*\log_3(8)}$
Firstly, $8 = 2^3 \rightarrow \log_3(8) = 3\log_3(2)$
Secondly, using the change of base formula: $\log_2(9) = \frac{\log_3(9)}{\log_3(2)} = \frac{2}{\log_3(2)}$
Thus, $\log_2(9) * \log_3(8) \rightarrow 2 * 3 = 6$, so, $2^6 = 64$