Math172Ex2

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Exercise 8: What digits are exactly to the left and to the right of the decimal point of $(\sqrt{10} + \sqrt{11})^{1000}$. (Explain your answer without using calculator to compute powers of $(\sqrt{10} + \sqrt{11})$. You can use calculators to estimate $\sqrt{10}$ and $\sqrt{11}$).

Proof. We have by the binomial theorem that:

$$(\sqrt{10} + \sqrt{11})^{1000} = \sum_{i=0}^{1000} \binom{1000}{i}(\sqrt{10})^i(\sqrt{11})^{1000-i}$$

$\square$