Which is the largest number: 7^{631}, 3^{921}, or 9^{341}?

Show how you've come up with the solution.

(see next page for solution)

There are several solution to the problem:

1. Logically:

Since $9^{341} = (3^2)^{341} = 3^{682} < 3^{921}$, the largest is either 3^{921} or 7^{631}.

Now, note that $3^3 < 7^2$, so $3^{921} = (3^3)^{307} < (7^2)^{307} = 7^{614} < 7^{631}$. So 7^{631} is the largest.

2. Calculate logarithm:

631 log(7)=1227
921 log(3)=1011
341 log(9)=749