

TRICKY PROBLEM

Find the remainder when 75^{75} is divided by 37.

Sol: 75^{75} is very big number dividing such a big number directly with 37 is difficult.

$$75 = 2(37) + 1 \Rightarrow 75^2 = (2(37) + 1)^2 = 4(37)^2 + 2(2(37)) + 1 = 37M + 1$$

Similarly we can prove that any power of 75 can be written as

$75^{75} = 37M + 1$. Hence given number is divided with 37 gives the remainder 1.