(b) If D lies on BC produced so that DEF is a straight line, prove that P also lies on the circumcircle of the triangle ABC.

6. A n digit number is narcissistic if the sum of its digits each raised to the power of n equals the number. Show that there are no 2-digit narcissistic numbers.

Senior Questions

1. Show that the function $f(x) = (x - 1) \ln 10 - x \ln 9 - \ln x$ is positive for all $x \geq N$ for some N.

2.