

EXERCISES

1. How many roots does the equation $z^7 - 2z^5 + 6z^3 - z + 1 = 0$ have in the disk $|z| < 1$? *Hint:* Look for the biggest term when $|z| = 1$ and apply Rouché's theorem.

2. How many roots of the equation $z^4 - 6z + 3 = 0$ have their modulus between 1 and 2?

3. How many roots of the equation $z^4 + 8z^3 + 3z^2 + 8z + 3 = 0$ lie in the right half plane? *Hint:* Sketch the image of the imaginary axis and apply the argument principle to a large half disk.