Master AdPharming
Master BiWEM

July 2019

UE PIC - Math Refresher Course

Resit exam

– Duration: 1h30 –

1) Compute the real and imaginary part of $z = \dfrac{(3+5i)^2}{1-2i}$.

2) Compute the trigonometric form of $z = 1 + i\sqrt{3}$ and then compute the real and imaginary part of z^6.

3) Compute the trigonometric form of $\dfrac{3+2i}{2-i}$.

4) Check that $x = -1$ is a root of $x^3 + 2x^2 - 11x - 12 = 0$. Compute all the roots.

5) Compute the partial fraction decomposition of:

$$\frac{x^4}{x^2-1}$$

6) Compute the following limits:

$$\lim_{x\to+\infty} \frac{x^2-x}{9x^5-6x^2+7}$$

$$\lim_{x\to 2} \frac{x^2-4}{x^2-3x+2}$$

$$\lim_{x\to 3+} \frac{1-4x}{x-3}$$

7) Using the Laplace transform solve the following differential equation:

$$\ddot{y}(t) + 5\,\dot{y}(t) + 6\,y(t) = 0$$

with: $\quad y(0^-) = 2 \quad ; \quad \dot{y}(0^-) = 3$