

MATH2214 - Fall 03- Review For Test N2 - Konaté

Notice: Show your work. A right answer with a bad reasoning will be considered as wrong. No notebook allowed, calculators (not symbolic calculators) may be used. abstracts allowed.

- 1• Find R and θ such that $(-1 - i) = Re^{i\theta}$. Use your answer to solve in the set of complex numbers the equation: $r^4 = -1 - i$.
- 2• Find the general solution of $y^{(3)} - 2y'' + y' = 0$
- 3• Find a particular solution of $y'' + 4y = t + 2 \sin t$
- 4• If one fundamental solution of $ay'' + by' + cy = 0$ where a , b , and a are three constant real numbers is $y_1(t) = e^t \cos 2t$, find the other fundamental solution.
- 5• Find the largest interval in which the following initial value problem (IVP) is certain to have a unique solution:

$$\begin{cases} (t-1)y'' + t^2y' + (2 \tan(t))y = \sin(t) \\ y(3) = \pi; \quad y'(3) = 1 \end{cases}$$

- 6• Consider the equation $ty'' + 2(t-1)y' + (t-2)y = 0$. Show that $y_1(t) = e^t$ is solution to it then use the reduction of order to set up a second one.
 - 7• Set up (only) the expression of the general solution of the equation but do not calculate the coefficients $y'' + y' = 2t + e^{-t}$.
 - 8• If a vibrating free motion with damping can be described by the following equation: $u'' + 2u' + 5u = 0$ under the conditions $u(0) = 1$ and $u'(0) = 0$. Find the mass m , the damping coefficient γ and the spring constant k . Determine the quasi frequency and the quasi period of the motion and the curves limiting its amplitude versus time.
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