

7 Mar, 2014
MATH 1005D
Total marks: 25

TEST 3

1. Solve to following homogeneous differential equations [8 marks]

(a)

$$y^{(4)} - 2y^{(3)} + 5y^{(2)} = 0$$

(b)

$$y^{(5)} + 2y^{(4)} - 16y' - 32y = 0$$

2. Solve the system of differential equations [8 marks]

$$\begin{aligned}x' &= 4x + 2y \\y' &= 3x + 3y\end{aligned}$$

3. For each of the following sequences, determine if it *converges* or *diverges*. For any sequence that converges, state the value to which it converges. You must show your work. [9 marks]

(a) $\left\{ \frac{3n^2 - 2n - 3}{\sqrt{2n^4 + 3n + 1}} \right\}_{n=1}^{\infty}$

(b) $\left\{ \sqrt{n^3 + 1} - n \right\}_{n=1}^{\infty}$

(c) $\left\{ \frac{e^n}{n!} \right\}_{n=1}^{\infty}$