Maths Mid Term

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Q1.Solve the equation to obtain roots:

$$x^2 + 2x + 9 = 0$$

Q2.Solve the following inequation and write down the solution set:

$$11x - 4 < 15x + 4 <= 13x + 14, x \in W$$

Q3.State whether the following differential equations are linear or non linear,justify and solve.
$$a)xy' + 2y = e^{3x}/x, x > 0$$
$$b)x^2ydy/dx - xy^2 = 1$$

Q4.Which of the given values of x and y will make the following pairs of matrices equal?

$$\begin{bmatrix} 3x+7 & 5 \\ y+1 & 2-3x \end{bmatrix} = \begin{bmatrix} 0 & y-2 \\ 8 & 4 \end{bmatrix}$$

$a)x = \frac{-1}{3}, y = 7$ $b)Not possible$

$c)y = 7, x = \frac{-2}{3}$ $d)x = \frac{-1}{3}, y = \frac{-2}{3}$

Q5.Solve the following integral

$$\int_7^8 (3x^4 + 2x + 3x^2)dx$$

Q6. Evaluate the limit of the following

$$\lim_{x \to +\infty} \sqrt[3]{x} + 12x - 2x^2$$

Q7.Solve the determinant
$$\begin{vmatrix} 3 & 4 & 5 & 9 \\ 1 & 4 & 8 & 9 \\ 2 & 6 & 84 & 6 \\ 7 & 4 & 0 & 2 \end{vmatrix}$$

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1 Differential Equations

1.1 Types

1.1.1 Ordinary Differential Equations.

1.1.2 Partial Differential Equations.

1.1.3 Linear Differential Equations.

1.1.4 Non Linear Differential Equations.

1.1.5 Homogenous Differential Equations.

1.1.6 Non-Homogenous Differential Equations.