
Instructions: Write complete legible solutions to the following problems in the space provided.
Be sure to supply all the necessary steps that lead to your answers.

1&2 Verify that the given differential equation is exact, then solve.

1. $(2x - 1)dx + (7y + 6)dy = 0$ Ans _____

2. $(x^2 + 2xy - y^2)dx + (y^2 + 2xy - x^2)dy = 0$ Ans _____

3. Find the value of k so that the given differential equation is exact.

$$(y^3 + kxy^4 - 2x)dx + (3xy^2 + x^2y^3)dy = 0$$

Ans _____

4. Show that the given equation is not exact, then use the condition on exactness to generate an integrating factor, then use it solve the non-exact equation:

$$12xydx + (4y + 18x^2)dy = 0$$

Ans _____