

Math 274 Quiz 3

Sections: 2.5-2.6

14 September 2018

Name: _____
Point values in

boxes

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- 1.
- | |
|---|
| 2 |
|---|
- Show the equation

$$(y - xy^2)dx - xdy = 0.$$

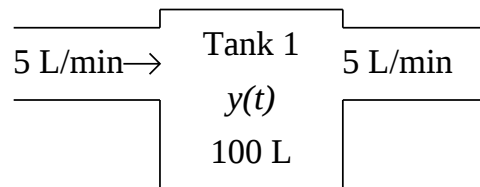
is not exact.

- 2.
- | |
|---|
| 3 |
|---|
- The equation

$$(3 + 2xy^3)dx + (3x^2y^2 + \sin y)dy = 0$$

is exact. Find a general solution.

- 3.
- | |
|---|
| 5 |
|---|
- Consider a 100 L tank of pure water (imported from the Alps) into which a saline solution begins to flow at a constant rate of 5 L/min. The solution in the tank is well-mixed and flows out of the tank at 5 L/min. The concentration of the saline solution entering the tank is 0.5 kg/L.

Letting $y(t)$ denote the mass of salt in the tank after t minutes, determine $y(t)$.