

Instructions: Show all work. Use exact answers unless otherwise asked to round.

1. Find the particular solution to the second order equation $y'' - 5y' - 14y = 4e^{2t} - 9 \cos 3t$ using the method of undetermined coefficients.

2. A two-tank system initially starts out with 10 kg of salt in tank A and none in tank B. A 1 kg/L solution of brine is added to Tank A at a rate of 20 L/min. Water is cycled between the tanks as shown in the diagram, and then water flows out of Tank B at a rate of 20 L/min. Set up a system of differential equations that models the amount of salt in each tank. (You do not need to solve it.)

