MTH 267, Quiz #3, Fall 2022 Name _____

Instructions: Show all work. Answers without work required to obtain the solution will not receive full credit. Some questions may contain multiple parts: be sure to answer all of them. Give exact answers unless specifically asked to estimate.

1. Solve the differential equation $\frac{dy}{dt} = 4 + y$ for the analytic solution. Solve for the missing constant if the initial condition is y(0)=1. (Use linear/integrating factor methods.)

2. Solve the differential equation $y' = \frac{x^2 - y^2}{xy}$.

3. Solve the Bernoulli equation $y' + \frac{3}{x}y = \frac{4}{x}e^{-2x}y^{\frac{4}{3}}$, $y(1) = 2$.