Instructions. Show all work, with clear logical steps. No work or hard-to-follow work will lose points.

Problem 1. (4 points) Determine whether the following differential equations is linear.

(a.) $y' + (x^2 + \cos x)y = x$

(b.) $yy' = x$

(c.) $y' + xy^2 = x - 1$

(d.) $y' - xy = x^2y + 3$

Problem 2. (4 points) Find the general solution for the differential equation

$$xy' + y = 3y' + x^2 + 5, \qquad x > 3.$$

Problem 3. (2 points) When is our next exam on February 20?