

Please show and explain your work where necessary. Good luck!!

1. (*8 points*) For each of the following differential equations, determine whether it is exact or not. (Use math to justify your answer.)

a. (*2 pts*) $x \, dx - y \, dy = 0$

b. (*3 pts*) $y \, dx + x \, dy = 0$

c. (*3 pts*) $(y - x) \, dx + (x - y) \, dy = 0$

2. (*2 points*) Compute the integrating factor for the differential equation $xy' = 5 - 2y$.