Worksheet 4 / 10 points

Name: .

Find a one-parameter family of solutions:

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

Start by showing that the following differential equation is exact. One method of solving is easier than the another.

$$\left(\sqrt{x^2+y^2} + \frac{x^2}{\sqrt{x^2+y^2}}\right)dx + \frac{yx}{\sqrt{x^2+y^2}}dy = 0.$$

Find a one-parameter family of solutions:

$$e^x(x+1)\,dx + (ye^y - xe^x)\,dy$$

Use the integration factor $\dfrac{1}{x^2+y^2}$ to solve

$$y\,dx - (y^2 + x^2 + x)\,dy = 0$$