

1.(1 pt) The following differential equation is exact.

Find a function $F(x,y)$ whose level curves are solutions to the differential equation

$$ydy - xdx = 0$$

$F(x,y) =$ _____

2.(1 pt) Use the "mixed partials" check to see if the following differential equation is exact.

If it is exact find a function $F(x,y)$ whose level curves are solutions to the differential equation

$$(-1x^3 + 3y)dx + (3x + 4y^3)dy = 0$$

$F(x,y) =$ _____

3.(1 pt) Use the "mixed partials" check to see if the following differential equation is exact.

If it is exact find a function $F(x,y)$ whose level curves are solutions to the differential equation

$$(1xy^2 + 1y)dx + (1x^2y + 1x)dy = 0$$

$F(x,y) =$ _____

4.(1 pt) Use the "mixed partials" check to see if the following differential equation is exact.

If it is exact find a function $F(x,y)$ whose level curves are solutions to the differential equation

$$\frac{dy}{dx} = \frac{+1x^2 + 3y}{0x + 4y^2}$$

$F(x,y) =$ _____

5.(1 pt) Use the "mixed partials" check to see if the following differential equation is exact.

If it is exact find a function $F(x,y)$ whose level curves are solutions to the differential equation

$$(2e^x \sin(y) + 2y)dx + (2x + 2e^x \cos(y))dy = 0$$

$F(x,y) =$ _____

6.(1 pt) Check that the equation below is not exact but becomes exact when multiplied by the integrating factor.

$$x^2y^3 + x(1 + y^2)y' = 0$$

Integrating factor: $\mu(x,y) = 1/(xy^3)$.

Solve the differential equation.

You can define the solution curve implicitly by a function in the form

$F(x,y) = G(x) + H(y) = K$ $F(x,y) =$ _____

7.(1 pt) Find an explicit or implicit solutions to the differential equation

$$(x^2 + 1xy)dx + xdy = 0$$

$F(x,y) =$ _____