Exact equations

Test to see if each equation is exact. If so, find its solution.

1. $(2x + 3y)\, dx + (3x + 2y)\, dy = 0$

2. $(4x^2 + 3y^2)\, dx - 2xy\, dy = 0$

3. $\left(x^3 + \dfrac{y}{x}\right) dx + (y^2 + \ln x)\, dy = 0$

4. $(\cos x + \ln y)\, dx + \left(\dfrac{x}{y} + e^y\right) dy = 0$

ANSWERS

1. $x^2 + 3xy + y^2 = C$

2. Not exact

3. $3x^4 + 4y^3 + 12y \ln x = C$

4. $\sin x + x \ln y + e^y = C$