For questions 1 through 7, verify that the given differential equation is exact, then find the general solution of the differential equation. (Hint: make sure the differential equation is in the correct form) Primes denote derivatives with respect to $x$.

1. $(4x - y)dx + (6y - x)dy = 0$

2. $(3x^2 + 2y^2)dx + (4xy + 6y^2)dy = 0$

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

5. \((2y + xe^{xy})y' = -(1 + ye^{xy})\)

6. \((\cos x + \ln y)dx + \left(\frac{x}{y} + e^y\right)dy = 0\)
7. \((e^x \sin y + \tan y)dx + (e^x \cos y + x \sec^2 y)dy = 0\)

8. Find a general solution of the reducible second-order differentiable equation \(xy'' = y'\) 
   Assume \(x, y, \) and/or \(y'\) positive if helpful.