

**EXERCISES 13.1** (submit by 10.07.2015)

1. Find general solutions to the following homogeneous ODEs. (If the explicit solution is difficult to find, provide the implicit solution.)

(a)  $(x + 2y)dx - xdy = 0$

(b)  $y^2 + x^2y' = xyy'$

(c)  $(x^2 + y^2)y' = 2xy$ .

2. Find general solutions to the following ODEs by first reducing them to homogeneous equations. (If the explicit solution is difficult to find, provide the implicit solution.)

(a)  $x^3(y' - x) = y^2$

(b)  $ydx + x(2xy + 1)dy = 0$

(c)  $x - y - 1 + (y - x + 2)y' = 0$

(d)  $(y + 2)dx = (2x + y - 4)dy$ .