# TWK2A
# Separable DEs
# Problems

1. Solve $xy' = 4y$.
2. Solve $e^x y y' = e^{-y} + e^{-2x-y}$.
3. Solve $\frac{dP}{dt} = P - P^2$.
4. Show that an implicit solution of $2x\sin^2 y dx - (x^2+10)\cos y dy = 0$ is given by $\ln(x^2+10) + \csc y = c$. Find any singular solutions.
5. Find a function whose square plus the square of its derivative is 1.
6. Solve $dy - (y-1)^2 dx = 0$.
7. Solve $\frac{dy}{x} = \left(\frac{2y+3}{4x+5}\right)^2$.
8. Solve $\frac{dQ}{dt} = k(Q-70)$.
9. Solve $\frac{dy}{dt} + 2y = 1$ subject to $y(0) = \frac{5}{2}$.
10. Solve $ydy = x(1+x^2)^{-1/2}(1+y^2)^{1/2}dx$.
11. Solve $x^2y' = y - xy$ with $y(-1) = -1$.
12. Solve $\frac{dN}{dt} + N = Nte^{t+2}$.
13. Solve $y' = \frac{xy+2y-x-2}{xy-3y+x-3}$.
14. Solve $(e^x + e^{-x})y' = y^2$.
15. Find a solution of $xy' = y^2 - y$ that passes through **(a)** $(0,1)$, **(b)** $(0,0)$, **(c)** $\left(\frac{1}{2}, \frac{1}{2}\right)$, **(d)** $\left(2, \frac{1}{4}\right)$.