1. Give the general solution to the differential equation $y' = \frac{x^2}{\ln y}$. Hint: if needed, integrate $\int \ln y \, dy$ by parts with $u = \ln y$ and $dv = dy$.

2. [2.2.{15,20}] Solve the following IVPs explicitly.

    (a) $y' = 2x/(1 + 2y)$ with $y(2) = 0$

    (b) $y^2(1 - x^2)^{1/2} \, dy = \arcsin x \, dx$ with $y(0) = 1$.

3. [2.2.24] Solve the IVP $y' = (2 - e^x)/(3 + 2y)$ with $y(0) = 0$ and determine where the solution attains its maximum value.

4. [2.2.21] Solve the IVP $y' = (1 + 3x^2)/(3y^2 - 6y)$ with $y(0) = 1$ and determine the interval in which the solution is valid.