**Math 274 Quiz 2**
Sections: 2.2-2.4
7 September 2018

**Name:** _____

Point values in $\boxed{\text{boxes}}$.

1. $\boxed{5}$ Find an implicit general solution of

$$x^2y' = y\ln y - y'.$$

← See # 9 in §2.2

$$(x^2+1)\frac{dy}{dx} = y\ln y$$

$$\int \frac{dy}{y(\ln y)} = \int \frac{dx}{x^2+1}$$

$$\ln(\ln y) = \arctan x + C$$

<u>Note</u>: solutions of the form $y \equiv 1$ got lost

2. $\boxed{5}$ Find a general solution of

$$xy' + 2y = e^{-2x}.$$

$$y' - \left(-\frac{2}{x}\right)y = \frac{e^{-2x}}{x}$$

$$u(x) = e^{-\int -\frac{2}{x}dx} = e^{2\ln|x|} = x^2$$

$$x^2y' + 2xy = xe^{-2x}$$

$$(x^2y)' = xe^{-2x}$$

$$x^2y = \int xe^{-2x}\,dx$$

see quiz 1

$$= -\frac{xe^{-2x}}{2} - \frac{e^{-2x}}{4} + C$$

so $y = \frac{1}{x^2}\left(-\frac{xe^{-2x}}{2} - \frac{e^{-2x}}{4} + C\right)$