

Name: _____
Section: _____

Math 46: Quiz 5
February 26, 2015

Please show all work and solve the following problems.

1. State if the following ODE's are linear:

- (a) $2xy'' + x^2y' - (\sin(x))y = 2$
(b) $3y' + xy = e^{-x^2}$
(c) $y'' + \sqrt{y'} + y = x^2$

Solution: (a) Linear
(b) Linear
(c) Nonlinear

□

2. Find the Wronskian of the given set of functions: $\{e^{2x}, e^{3x}\}$.

Solution: We do this by direct computation:

$$W = \begin{vmatrix} e^{2x} & e^{3x} \\ 2e^{2x} & 3e^{3x} \end{vmatrix} = 3e^{5x} - 2e^{5x} = e^{5x} \neq 0$$

So the solutions are linearly independent.

□