

Quiz 2

1. Which of the following initial value problems have a unique solution?

(a) $3y' - 7xy = 5x$, $y(x_0) = y_0$

(b) $y' = y^{1/2} \cos(x)$, $y(0) = 0$

(c) $y'' + 4y' - 6y = 0$, $y(0) = 5$, $y'(0) = 0$

(d) $y' = y^2 \sin(x)$, $y(0) = 0$

2. Solve the initial value problem

$$y'' + 5y' + 6y = 0, \quad y(0) = 2, y'(0) = 3$$

(Hint: you may need the quadratic formula for roots of a polynomial:

$$x = (-b \pm \sqrt{b^2 - 4ac})/2a)$$

3. Compute the Wronskian of two solutions to Problem 2.

If you were unable to solve Problem 2, you may compute the Wronskian via Abel's formula up to a constant. Recall $W = Ce^{-\int p(t)dt}$.