

MATH 2120 – Quiz 2 Tuesday October 7, 2014

1. For the first order ODE

$$(3t + y) y' = t - 2y,$$

make the substitution $v(t) = y(t)/t$ to obtain a separable equation for $v(t)$. Write the equation for v in the form $dv/dt = G(v)/t$. **Do not** solve the equation, and you **do not** need to simplify $G(v)$.

2. Solve the IVP

$$\frac{d^2x}{dt^2} = 7x; \quad x(0) = \alpha, \quad x'(0) = \beta.$$

3. Consider the equidimensional equation

$$x^2y'' - 3xy' + 3y = 0. \tag{1}$$

We are given that $y = x$ is a solution of (1) (you need **not** verify this). Use reduction of order to find the other linearly independent solution y_2 .