Section 4.10

Class Exercise 1. Verify that $y_1 = 1$ and $y_2 = x^2$ are solutions of the differential equation $yy'' = \frac{1}{2}(y')^2$ but that $y = c_1y_1 + c_2y_2$ is, in general, not a solution. (#2)

Exercise 1. Solve the equation $y'' = 1 + (y')^2$ by using the substitution $u = y'$. (#4)

Class Exercise 2. Solve the equation $e^{-x}y'' = (y')^2$ by using the substitution $u = y'$. (#6)

Exercise 2. Solve the equation $(y+1)y'' = (y')^2$ by using the substitution $u = y'$. (#8)

Class Exercise 3. Solve the equation $y^2y'' = y'$ by using the substitution $u = y'$. (#10)

Class Exercise 4. Solve initial value problem.
$y'' + x(y')^2 = 0$, $y(1) = 4$, $y'(1) = 2$. (#12)

Exercise 3. Obtain the first six nonzero terms of a Taylor series solution, centered at 0, of the given initial-value problem. (#18)
$y'' + y^2 = 1$, $y(0) = 2$, $y'(0) = 3$

Class Exercise 5. Obtain the first six nonzero terms of a Taylor series solution, centered at 0, of the given initial-value problem. (#20)
$y'' = e^y$, $y(0) = 0$, $y'(0) =$ -1

Homework: 1, 5, 9, 11, 15, 17