

MATH 319, Fall 2013, Assignment 3

Textbook Questions

Section 2.2, #32 Show that the following differential equation is (power) homogeneous and then solve it:

$$\frac{dy}{dx} = \frac{x^2 + 3y^2}{2xy}$$

#35 Show that the following differential equation is (power) homogeneous and then solve it:

$$\frac{dy}{dx} = \frac{x + 3y}{x - y}$$

Section 2.4, #28 Solve the Bernoulli differential equation $t^2 y' + 2ty - y^3 = 0$, $t > 0$.

Section 2.6, #12 Determine whether the following differential equation is exact. If it is, solve it.

$$\frac{x \, dx}{(x^2 + y^2)^{3/2}} + \frac{y \, dy}{(x^2 + y^2)^{3/2}} = 0$$

#28 Find an integrating factor and solve the given equation

$$y \, dx + (2xy - e^{-2y}) \, dy = 0$$