

**Dr. Z.'s Calc4 Homework assignment 3**

Solve the differential equation

1. Solve the differential equation

$$y' = \frac{x^3}{y^2}$$

2. Solve the differential equation

$$y' = \frac{x^3}{y(1+x^4)}$$

3. Solve the differential equation

$$y' + y^3 \cos 2x = 0$$

4. Solve the differential equation

$$xy' = \sqrt{9 - y^2}$$

5. Solve the following initial value problem

$$y' = x^2 y^3 \quad y(1) = 2 \quad .$$

6. Solve the following initial value problem

$$y' = \sin x \sec y \quad , \quad y\left(\frac{\pi}{2}\right) = \frac{\pi}{4} \quad .$$

7. Find an equation of the curve that passes through the point  $(1, 1)$  and whose slope at  $(x, y)$  is  $y^4/x^2$ .

8. Find an equation of the curve that passes through the point  $(1, 2)$  and whose slope at  $(x, y)$  is  $y^2/x^5$ .