Midterm Project

Part 1 (50 points):

Requirements:

1. (10 points) Use both Excel and Eclipse. Your excel file must be clear (5 pts). Eclipse files must be error free (5 pts).
2. (35 points) Write a report including your results (10 points), graphs (10 points), sample calculation (10 points), discussion (5 points). No more than 3 pages. Either in **Word** or **PDF**.
3. (5 points) Your graphs must be clear and readable, for example, you must have necessary chart elements including axis name, units, chart title, reasonable axis range.
4. You need to submit your excel file, eclipse files, and report in an organized **ZIP** file.

Description:

A 1-D waterflood project is under consideration for a reservoir that is 300 ft wide, 20 ft thick, and 1000 ft long. The reservoir is horizontal and has porosity of 0.2 and an initial water saturation of 0.2 which is consider immobile. Residual oil saturation is 0.2. One producer is located on the one end of the reservoir and one injector is located on the other end. The injection rate is 300 bbl/day. Viscosity of water and oil are 1 and 2 cp. The relative permeability are given as:

$$k_{rw} = 0.8 * S^4;\ k_{ro} = (1 - S)^2$$

The waterflood duration is when water cut reaches 0.98.

You are asked to do following:

1. Calculate waterflood duration in days.
2. Calculate water breakthrough time in days.
3. Calculate cumulative oil production and plot cumulative oil production vs time, compare your excel and Eclipse results.
4. Calculate oil production rate and plot oil production rate vs time, compare your excel and Eclipse results.