Mathematics 172 Homework, October 3, 2023.

1. An amusement park has as one of its attractions a wishing well. Guests are to throw pennies into the pond to get their wishes. The well a population of goldfish. Unfortunately copper is poisonous to fish so the population of declines exponentially with an intrinsic growth rate of $r = -.15$ (fish/week)/fish. Let $P(t)$ be the size of the goldfish population t weeks after the wishing well is opened.

(a) What is the rate equation satisfied by $P(t)$?

(b) If the wishing well starts with 400 goldfish give a formula for the number of fish after t weeks.

(c) How many fish are left after a month (4 weeks)? How many after 12 weeks?

(d) The management of the park wishes to have a stable population of 300 fish in the wishing well. At what rate should they stock it to have this happen?