Mathematics 172

Quiz 5 Name: Key

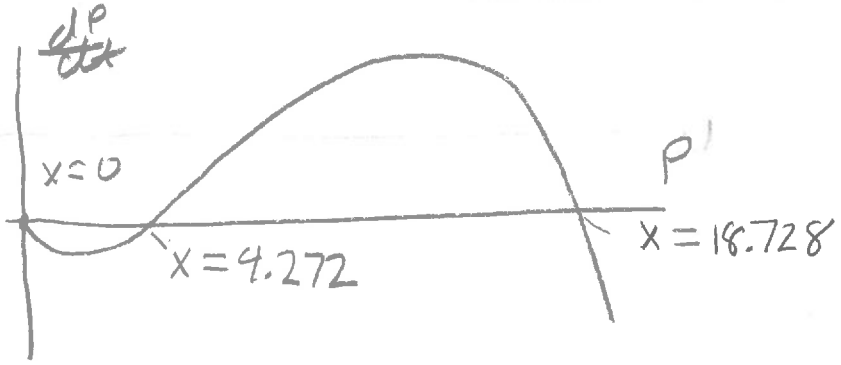
You must show your work to get full credit.

Let $P(t)$ be the number of kilograms of algae in a small pond after t weeks. Assume the size of the algae population grows by the rule

$$\frac{dP}{dt} = -.1P^3 + 2.3P^2 - 8P.$$

1. Use your calculator to plot \Y1 = -.1X^3 + 2.3 X^2 - 8X with Xmin =0 and Xmax =20 and make a rough sketch of the result here:

The zeros where found by doing 2nd CALC 2:zero. (X=0 was clear, so I did not use calculator for it.)



2. Use your calculator and the graph to find the equilibrium points accurate to 3 decimal places.

The equilibrium points are: 0, 4.272, 18.728

3. Which of the equilibrium points are stable?

The stable point(s) are: 0, 18.728

4. If $P(0) = 15$ estimate $P(100)$.

$P(100) \approx$ 18.728