Math 122
Quiz 6 Review

1. Mollie takes a pie out of the oven at a temperature of 200^o F and puts it in a room with a temperature of 70^oF. The temperature of the pie is 160^oF after 15 min.

a. What is the temperature of the pie after 30 min?

b. When will the pie be 120^oF.

2. Konrad hides his bagel in a refrigerator (temperature 32^oF). After 10 minutes, the bagel's temperature is 80^oF and after 20 minutes it is 44^oF. What was the temperature of the bagel when it was first put in the refrigerator?

3. Sketch the slope field for $\frac{dy}{dx} = x(6-y)$ and draw the solution that goes through $(0,0)$.

4. Sketch the slope field for $\frac{dy}{dx} = xy$ and draw the solution that goes through $(0,1)$.

Use Euler's method:

5. $\frac{dy}{dx} = y \qquad y(0) = 1$ find $y(1)$ with $h = 0.1$

6. $\frac{dy}{dx} = 2y - 1 \qquad y(0) = 1$ find $y(1)$ with $h = 0.1$

7. Solve $y' = 1.5\ y\left(1 - \frac{y}{4}\right) \qquad y(0) = 1$

8. In one of the dorms there are 1000 students. After break, 20 students return with the flu and 5 days later, 35 students have the flu. If the number of students with the flu follows the logistic model, how many students will have the flu after 2 weeks (14 days)?

9. Jonathan's fish farm is stocked with 100 fish. Suppose that the fish population satisfies the logistic equation and that the carrying capacity of the pond is 2000. If after 1 year the population has increased to 250.

a. find an equation for the number of fish after t years.

b. How long will it take for the fish population to reach 1000?

Answers

1. **a.** 132.3^oF

b. 39 min.

2. 224^oF

5. $y(1) \approx 2.5937$

6. $y(1) \approx 3.59587$

7. $y = \dfrac{4}{1 + 3e^{-1.5t}}$

8. 93

9. **a.** $P(t) = \dfrac{2000}{1 + 19e^{-.9985t}}$

b. $t = 2.949$ years