

Read each problem **very carefully** before starting to solve it. Each problem is worth 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. A breeding group of foxes is introduced into a protected area and exhibits logistic population growth. After t years the number of foxes is given by

$$N(t) = \frac{37.5}{0.25 + 0.76^t}.$$

- (a) How many foxes were introduced into the protected area?
- (b) Calculate $N(5)$ and explain the meaning of this number (with a short and precise sentence).
- (c) How does the population vary with time? In your answer include the average rate of increase over the first 10-year period and the average rate of increase over the second 10-year period.
- (d) Find the carrying capacity for foxes in the protected area.
- (e) When is 99% of the carrying capacity reached?