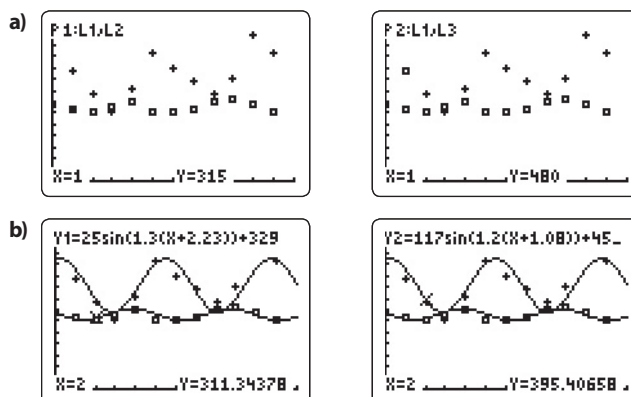# Predators and Prey

Teaching Suggestions

This performance task is designed to assess the specific expectations covered in Chapter 5.

The following Math Process Expectations can be assessed.

• Problem Solving
• Reasoning and Proving
• Reflecting
• Selecting Tools and Computational Strategies
• Connecting
• Representing
• Communicating

Level 3 Sample Response

a)

b)

c) The deer population has an equation of $y \doteq 25\sin(1.3(x + 2.23)) + 329$. The wolf population has an equation of $y \doteq 117\sin(1.2(x + 1.08)) + 457$.

d) Deer: maximum 354, minimum 304, average increase approximately 50 animals.
Wolves: maximum 574, minimum 340, average increase approximately 234 animals.

e) The deer have a phase shift of 2.23 years or about 27 months. The wolves have a phase shift of 1.08 years or about 13 months. If the deer population depends on the wolves they take longer to react to the change in the wolf population. You would expect there to be a lag in the consequences of a change in the population.

f) The population goes up and down in a somewhat predictable pattern. These cycles are periodic and can be fit with sinusoidal functions.

g) The points of intersection of the curves is where the populations are equal for both animals. This occurs near the low points in the wolf population.

h) One intersection is approximately in 1999. The rate of change of the deer population is 28 per year and the rate of change of the wolf population is 25 per year. The deer population is growing slightly faster than the wolf population at that time.

i) Any predator/prey situation should be related in the same way. For example: eagles and salmon.