MATH 123 **Graph and Function Interpretation**

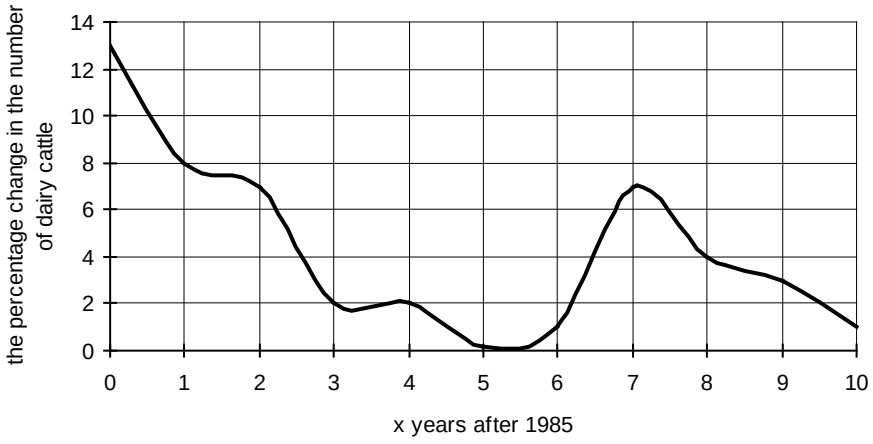
1. Suppose M(t) is the number of milk cows, in thousands, on the farms in the United States t years after 1900.
   (a) Interpret M(25) = 17,850
   (b) What are the input units?
   (c) What are the output units?
   (d) Can the input be negative? Explain.
   (e) Can the output be negative? Explain.

2. Suppose F(t) is the total world commercial fish catch, in thousands of metric tons, from the Pacific Ocean t years after the end of 1980.
   (a) Interpret F(4) = 5,859.
   (b) What are the input units?
   (c) What are the output units?
   (d) Can the input be negative? Explain.
   (e) Can the output be negative? Explain.

3. Suppose A(t) is the change in the number of AIDS cases reported in the United States t years after the end of 1980.
   (a) Can the input be negative? Explain.
   (b) Can the output be negative? Explain.

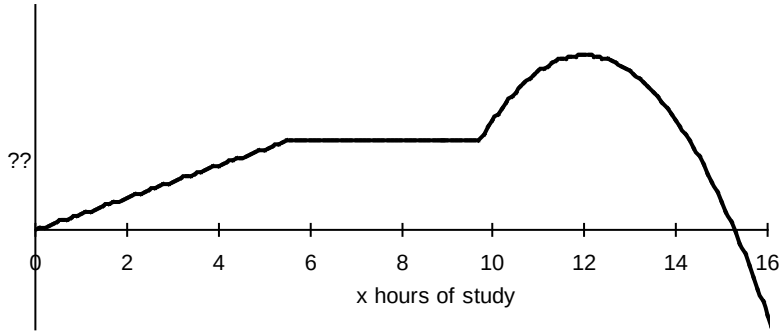
4. Suppose P(t) is the average amount of the daily United States petroleum imports, in thousands of barrels per day, t years after 1973.
   (a) Could the graph of y = P(t) appear to the left of the vertical axis? Explain.
   (b) Could the graph of y = P(t) appear below the horizontal axis.? Explain.

5. Suppose C(x) is the percentage change in the number of dairy cattle on farms in the United States x years after 1985. The graph of y = C(x) is given below.



   (a) What are the input units?
   (b) What are the output units?
   (c) Can the graph of y = C(x) appear to the left of the vertical axis? Explain.
   (d) Can the graph of y = C(x) appear below the horizontal axis? Explain.
   (e) Can the graph of y = C(x) be used to determine the number of dairy cattle on farms in the United States? Explain.

6. Consider the graph given below.



(a) Suppose G(x) is your grade out of 100 points on Exam I for 43.219A Calculus I after x hours of study. Could the graph, with appropriate output scale, represent the function G? Explain.
(b) Suppose G(x) is the change in your grade out of 100 points on Exam I for 43.219 Calculus I after x hours of study. Could the graph, with appropriate output scale, represent the function G? Explain.
(c) Suppose G(x) is the rate of change of your grade out of 100 points on Exam I for 43.219 Calculus I after x hours of study. Could the graph, with appropriate output scale, represent the function G? Explain.
(d) Suppose G(x) is the percentage change in your grade out of 100 points on Exam I for 43.219 Calculus I after x hours of study. Could the graph, with appropriate output scale, represent the function G? Explain.
(e) Could negative inputs be meaningful for any of the outputs given in Parts (a), (b), (c), or (d) above? Explain.
(f) Could the graph of G appear below the horizontal axis for any of the given meanings for G(x)? Explain.
(g) Assuming that the graph is meaningful for Parts (a), (b), (c), and (d) given above, state the input and the output units for each.

7. Suppose N(x) is the number of employees at the *Doors International Corporation* when the CEO is paid x hundred thousand dollars annually. The graph of y = N(x) is given below.

(a) Can the graph of N appear below the horizontal axis? Explain.
(b) Can the graph of N appear to the left of the vertical axis? Explain.
(c) What are the input units?
(d) What are the output units?
(e) What is the input?
(f) What is the output?