

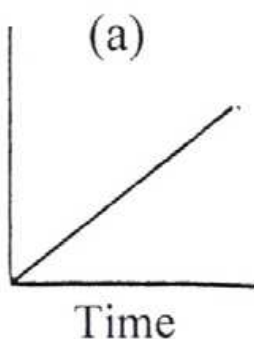
Hoisting the Flag

Every morning, on the summer camp, the youngest boy scout has to hoist the flag to the top of the flagpole.

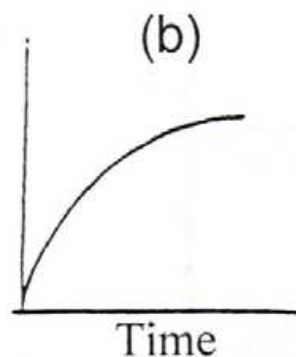
1. Explain in words what each of the graphs below would mean.
2. Which graph shows this situation most realistically? Explain.
3. Which graph is the least realistic? Explain.



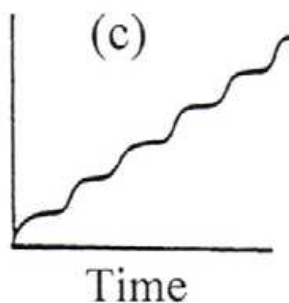
Height of flag



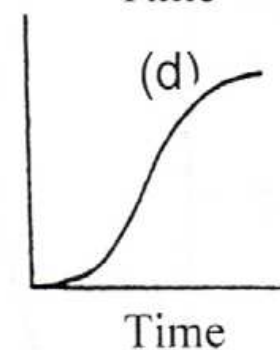
Height of flag



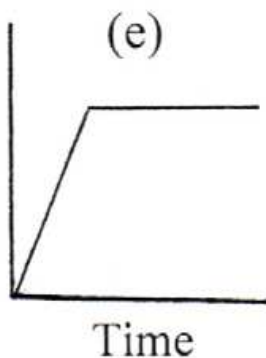
Height of flag



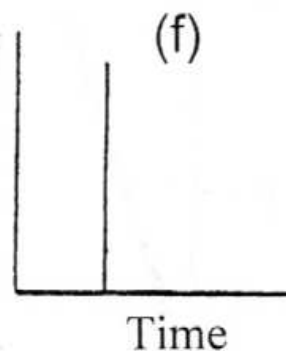
Height of flag



Height of flag



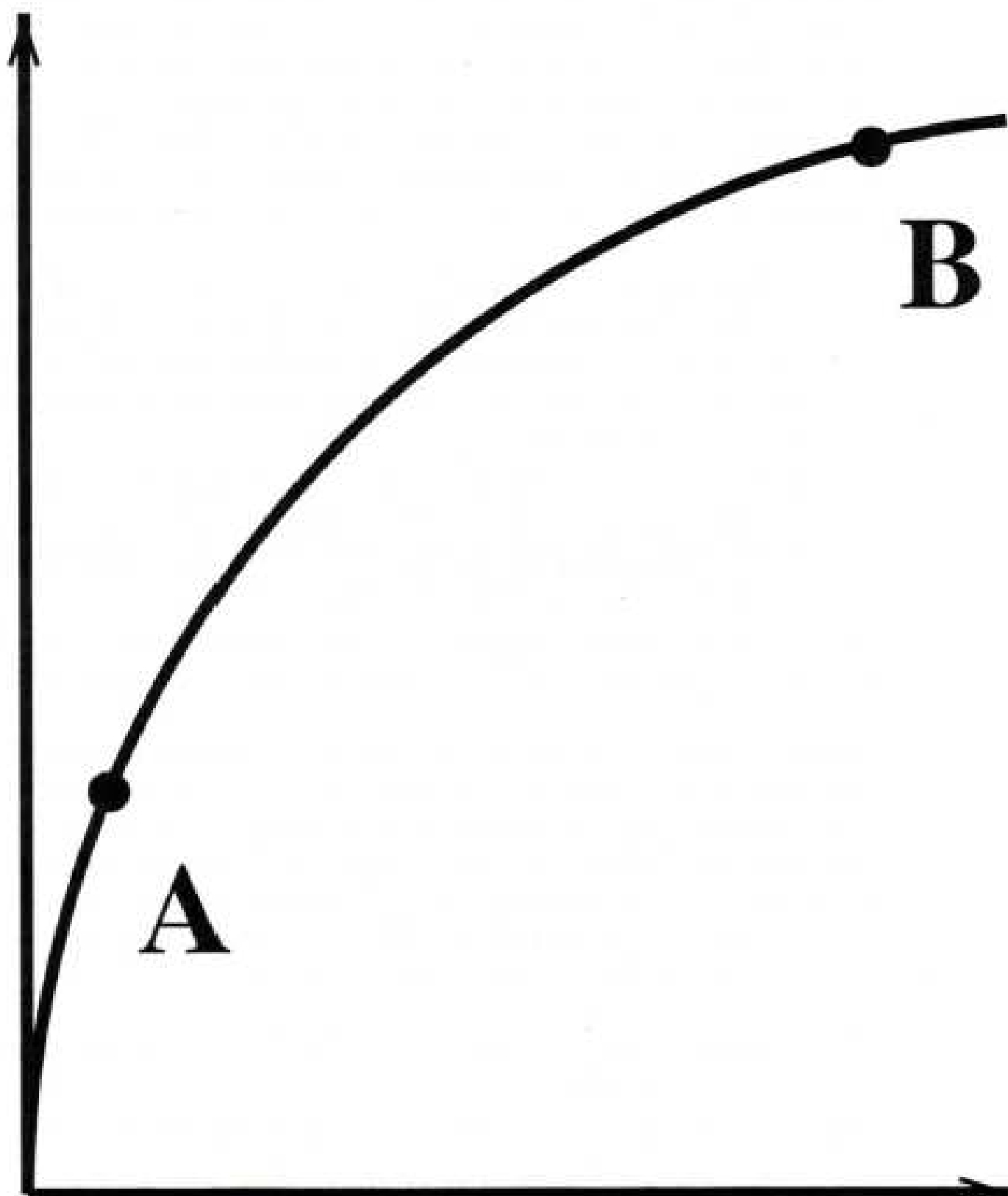
Height of flag



Adapted from:

The Language of Functions and Graphs
Shell Centre for Mathematical Education
University of Nottingham, 1985
Nottingham NG7 2RD, England

Height of Flag

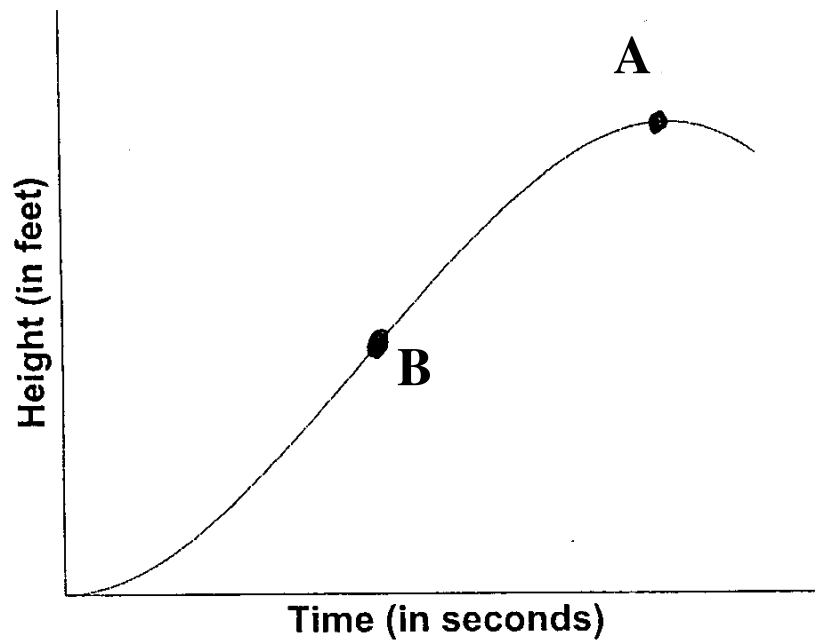


A

B

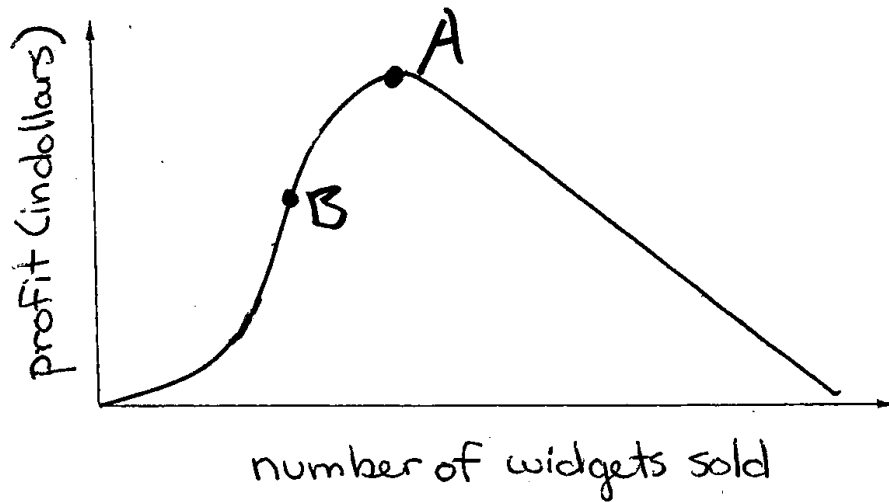
Time

9. (8 pts) Every morning at summer camp, the youngest boy scout raises the flag to the top of the flagpole. Below is a graph of the function representing this process.



- Mark a point on the graph where the flag is highest. Label this point with the letter A.
- Mark a point on the graph where the derivative of the function is greatest. Label this point with the letter B.
- Explain, in terms of the flag, why you put point B where you did.

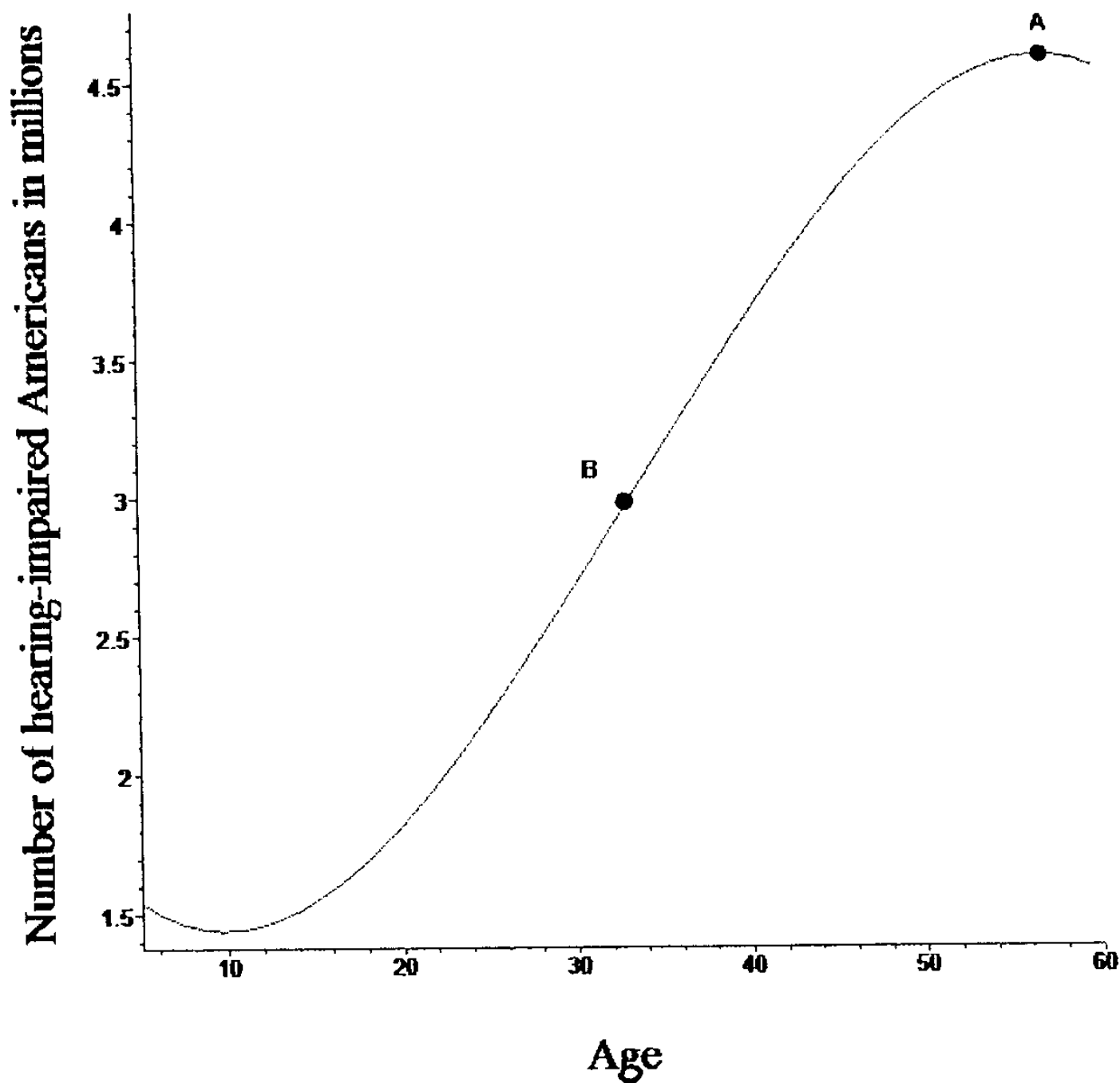
2. (8 pts) The profit the Bandlow Widget Company earns depends on how many widgets are sold. The function shown in the graph relates the number of widgets sold to the profit the company earns.



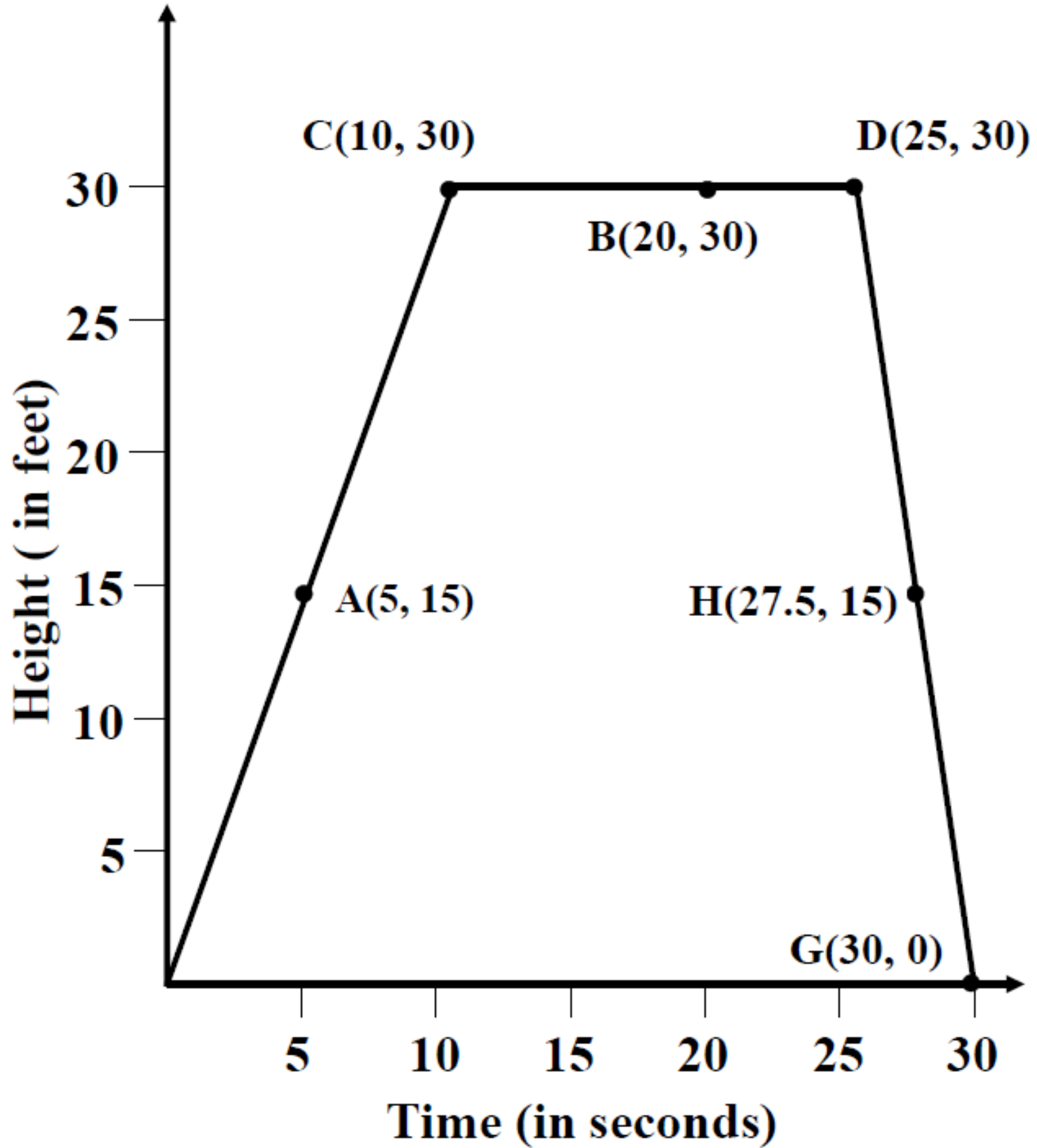
- (a) Mark a point on the graph where the company's profit is highest. Label this point with the letter A.
- (b) Mark a point on the graph where the derivative of the function is greatest. Label this point with the letter B.
- (c) Explain, in terms of the situation (number of widgets sold and company profits), what is happening at the point B and why this point might be important to the company.

The function in the graph below shows the relationship between age and the number of hearing-impaired Americans.

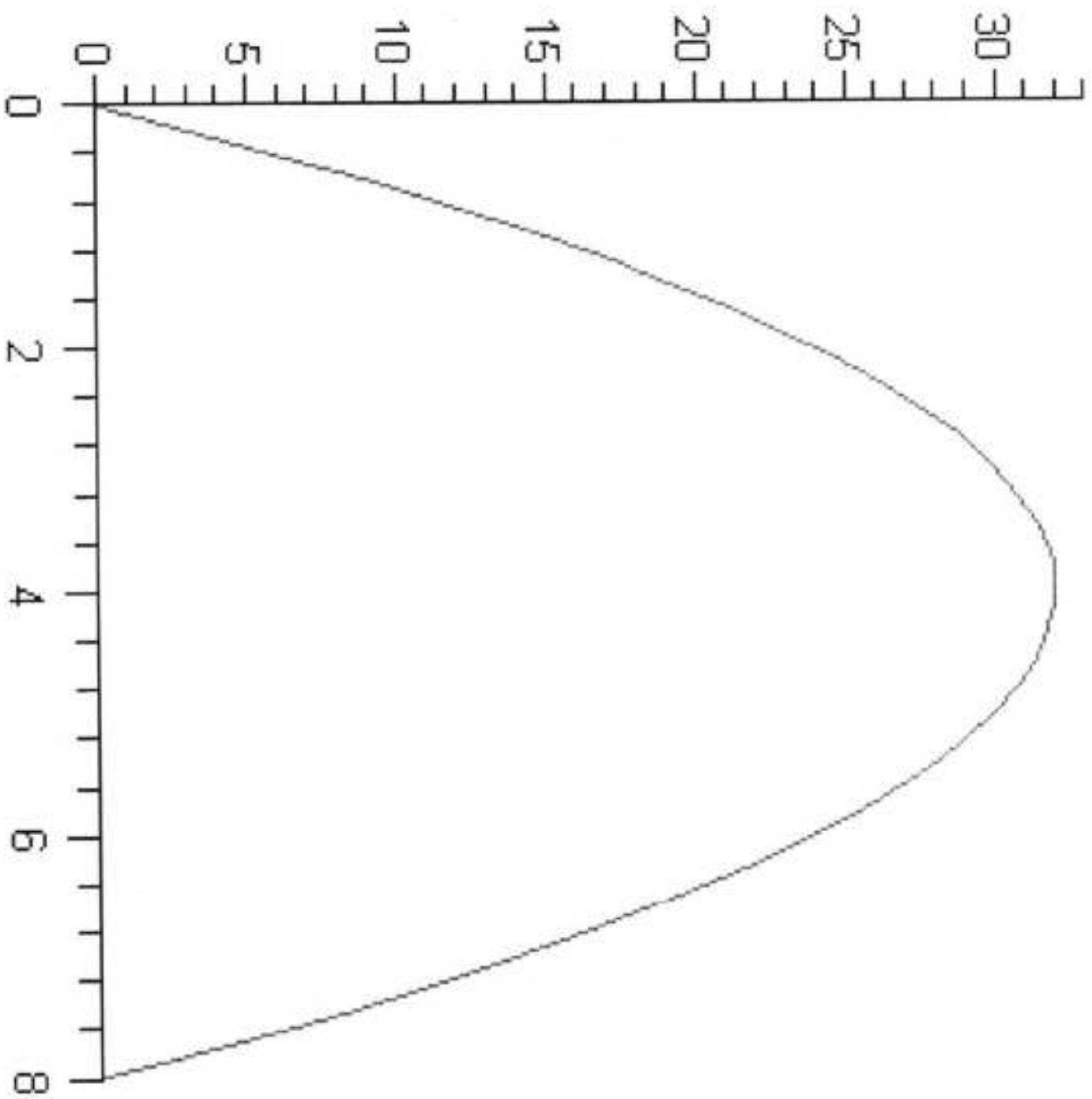
(From the American Speech-Language Hearing Association).



- Interpret the meaning of the points *A* and *B*.
- What age should a hearing aid company target with advertisements?



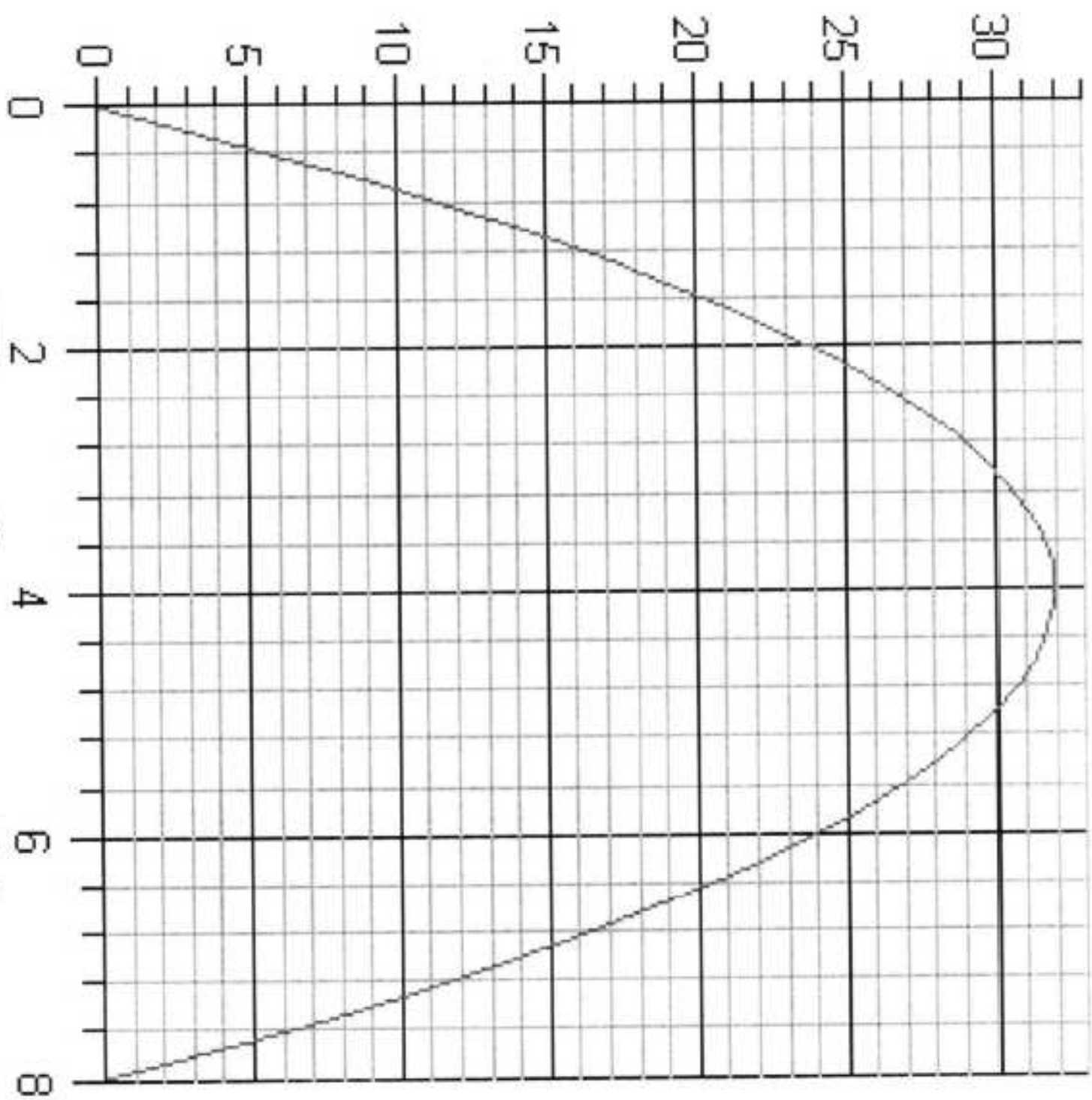
Height (in feet)



Time (in seconds)

Height (in feet)

Time (in seconds)



Point, P	SLOPE BETWEEN P AND $(4, 32)$
$(8, 0)$	-8
$(5, 30)$ $f(5) = 30$	-2
$(4.5, 31.5)$ $f(4.5) = 31.5$	-1
$(4.1, 31.98)$ $f(4.1) = 31.98$	-0.2
$(4.01, 31.9998)$ $f(4.01) = 31.9998$	-0.02
$(4.001, 31.999998)$ $f(4.001) = 31.999998$	-0.002
etc.	