

1 The function  $f$  is defined for all  $x$  in the interval  $4 < x < 6$ . Which of the following statements, if true, implies that  $\lim_{x \rightarrow 5} f(x) = 17$ ?

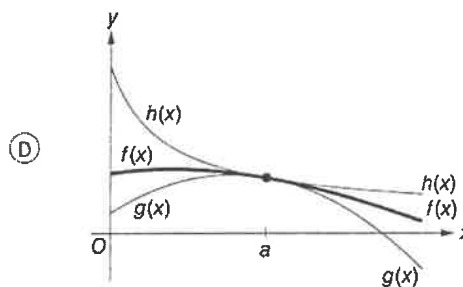
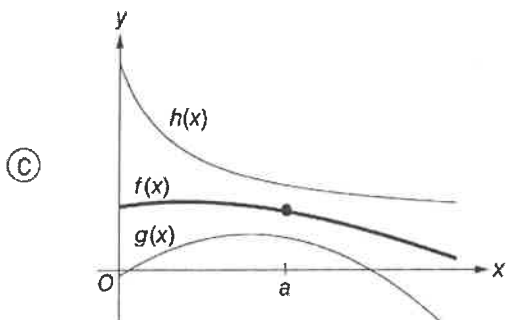
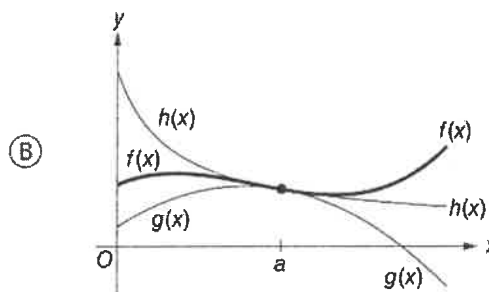
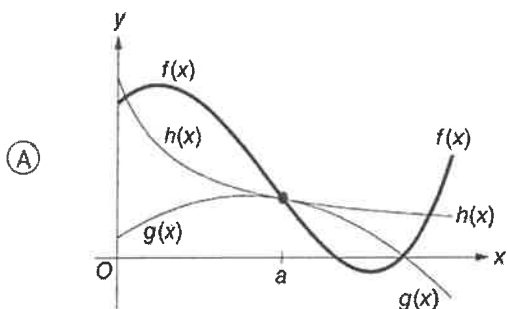
- (A) There exists a function  $g$  with  $f(x) \leq g(x)$  for  $4 < x < 6$ , and  $\lim_{x \rightarrow 5} g(x) = 17$ .
- (B) There exists a function  $g$  with  $g(x) \leq f(x)$  for  $4 < x < 6$ , and  $\lim_{x \rightarrow 5} g(x) = 17$ .
- (C) There exist functions  $g$  and  $h$  with  $f(x) \leq g(x) \leq h(x)$  for  $4 < x < 6$ , and  $\lim_{x \rightarrow 5} g(x) = \lim_{x \rightarrow 5} h(x) = 17$ .
- (D) There exist functions  $g$  and  $h$  with  $g(x) \leq f(x) \leq h(x)$  for  $4 < x < 6$ , and  $\lim_{x \rightarrow 5} g(x) = \lim_{x \rightarrow 5} h(x) = 17$ .

2 The function  $g$  is given by  $g(x) = \frac{7x-26}{x-5}$ . The function  $h$  is given by  $h(x) = \frac{3x+14}{2x+1}$ . If  $f$  is a function that satisfies  $g(x) \leq f(x) \leq h(x)$  for  $0 < x < 5$ , what is  $\lim_{x \rightarrow 2} f(x)$ ?

- (A)  $\frac{3}{2}$
- (B) 4
- (C) 7
- (D) The limit cannot be determined from the information given.

③

Let  $f$  be a function of  $x$ . The value of  $\lim_{x \rightarrow a} f(x)$  can be found using the squeeze theorem with the functions  $g$  and  $h$ . Which of the following could be graphs of  $f$ ,  $g$ , and  $h$ ?



④ Use Squeeze Theorem to find:

a)  $\lim_{x \rightarrow 0} x^2 \cos\left(\frac{1}{x^2}\right)$

b)  $\lim_{x \rightarrow \infty} \frac{2 - \cos x}{x + 3}$