

Practice Exam BC-1

Calculus BC

Section I, Part A

Time — 55 minutes

Number of questions — 28

No calculator is allowed for these questions.

| x | $f(x)$ | $f'(x)$ |
|---------------|---------------|----------------|
| 0 | 1 | 2 |
| $\frac{1}{2}$ | 2 | 4 |
| 1 | 3 | 5 |
| $\frac{3}{2}$ | $\frac{1}{2}$ | $-\frac{1}{2}$ |
| 2 | $\frac{3}{2}$ | -2 |

Questions 1 and 2 refer to the table above.

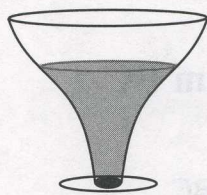
1. If f is a differentiable function on the interval $0 < x < 2$, find the derivative of the inverse function $f^{-1}(x)$ at $x = \frac{1}{2}$.

(A) -4 (B) -2 (C) -1 (D) $-\frac{1}{8}$ (E) $-\frac{1}{16}$

2. Using the table above and the fact that $f'(x)$ is continuous on the interval

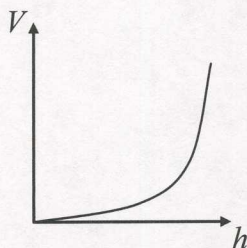
$$0 \leq x \leq 2, \int_0^2 f'(x) dx =$$

(A) -4 (B) -2 (C) 0 (D) $\frac{1}{2}$ (E) $\frac{3}{2}$

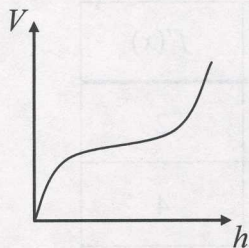


3. The glass above is initially empty, then gradually filled with water. Which of the following graphs best represents the volume V of water versus the height h of the water?

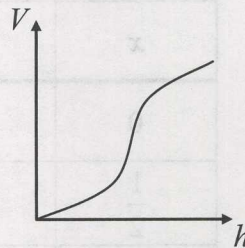
(A)



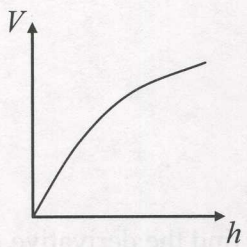
(B)



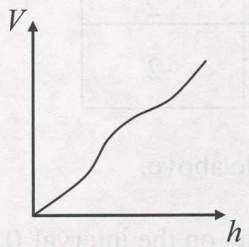
(C)



(D)



(E)



4. If $f(x) = \sum_{n=0}^{\infty} \frac{(2x+1)^{n+1}}{n!}$, then $f''\left(-\frac{1}{2}\right) =$

(A) 0

(B) 1

(C) 2

(D) 4

(E) 8

5. If $f(x)$ is a continuous and even function and $\int_0^4 f(x) dx = -5$ and $\int_4^6 f(t) dt = 2$, then the average value of $f(x)$ over the interval from $x = -6$ to $x = 4$ is

(A) -0.2

(B) -0.8

(C) 0.2

(D) 1.2

(E) 2

