2023 AP Daily: Practice Sessions

AP Calculus AB

Session 5 – MCQ

1. Let f be the function with first derivative $f'(x) = 2\cos(x^2)$. If $f(3) = 7.5$, what is the value of $f(2)$?

   A. 13.554
   B. 7.983
   C. 7.017
   D. 6.193

x	$h(x)$
3	8
10	6
12	0

2. The table shown gives values of a continuous function h at selected values of x. Based on the information in the table, which of the following must be true?

   A. $h(x) = 7$ occurs exactly once in the interval $3 < x < 12$.
   B. h has a minimum at $x = 12$.
   C. $\lim_{x \to 10} h(x) = 6$
   D. $h'(c) = -3$ for at least one value $x = c$ in the open interval $10 < x < 12$.

3. Let f be a continuous function such that $\int_1^{10} f(x)dx = 7$ and $\int_5^{10} f(x)dx = -8$. What is the value of $\int_1^5 [2f(x) + 3]dx$?

   A. 10
   B. 27
   C. 33
   D. 42

4. The temperature in a gym at 6:00 am $(t = 6)$, is 65 degrees Fahrenheit. Over the next 16 hours $(6 \leq t \leq 22)$, the differentiable function $h(t)$, measures the rate of temperature change in the gym in degrees Fahrenheit per hour where t is hours since midnight. Which of the following is the best interpretation of $65 + \int_6^{18} h(t)dt$?

   A. The temperature of the gym, in degrees Fahrenheit, at 6:00 pm.
   B. The average temperature of the gym, in degrees Fahrenheit, between 6:00 am and 6:00 pm.
   C. The change in the temperature of the gym, in degrees Fahrenheit, between 6:00 am and 6:00 pm.
   D. The rate at which the temperature in the gym is changing, in degrees Fahrenheit per hour, at 6:00 pm.