KEY

AP Calculus AB

Practice Derivatives of Inverse Functions

1. From the values of f shown, estimate $f'(2)$.

x	1.92	1.94	1.96	1.98	2.00
$f(x)$	6.00	5.00	4.40	4.10	4.00

(A) –0.10 (B) –0.20 (C) –5 (D) –10 (E) –25

2. Using the values in the table for question 1, estimate $(f^{-1})'(4)$.
(A) –0.2 (B) –0.1 (C) –5 (D) –10 (E) –25

3. The left half of the parabola defined by $y = x^2 - 8x + 10$ for $x \leq 4$ is a one-to-one function; therefore its inverse is also a function. Call that inverse g. Find $g'(3)$.
(A) –1/2 (B) –1/6 (C) 1/6 (D) 1/2 (E) 11/2

4. Suppose $f(x) = 2x^3 - 3x$. If $h(x)$ is the inverse function of f, then $h'(1) =$
(A) –1 (B) 1/5 (C) 1/3 (D) 1 (E) 3

5. Suppose $f(1) = 2$, $f'(1) = 3$, and $f'(2) = 4$. Then $(f^{-1})'(2) =$
(A) –1/3 (B) –¼ (C) ¼ (D) 1/3 (E) none of these

6. If $f(x) = x^3 - 3x^2 + 8x + 5$ and $g(x) = f^{-1}(x)$, then $g'(5) =$
(A) 8 (B) 1/8 (C) 1 (D) 1/53 (E) 53

In questions 7 – 10, differentiable functions f and g have the values shown in the table:

x	f	f'	g	g'
0	2	1	5	–4
1	3	2	3	–3
2	5	3	1	–2
3	10	4	0	–1

7. If $A = f + 2g$, then $A'(3) =$
(A) –2 (B) 2 (C) 7 (D) 8 (E) 10

8. If $H(x) = [f(x)]^{1/2}$, then $H'(3) =$
(A) 1/4 (B) $\frac{1}{2\sqrt{10}}$ (C) 2 (D) $\frac{2}{\sqrt{10}}$ (E) $4\sqrt{10}$

9. If $P(x) = f(x^3)$, then $P'(1) =$
(A) 2 (B) 6 (C) 8 (D) 12 (E) 54

10. If $S(x) = f^{-1}(x)$, then $S'(3) =$
(A) –2 (B) –1/25 (C) 1/4 (D) 1/2 (E) 2