DATE: _______________

Derivatives of Inverse Functions

1. The function $f(x) = x^5 + 3x - 2$ passes through the point $(1,2)$. Let f^{-1} denote the inverse of f. Then $(f^{-1})'(2)$ equals:

(A) $\frac{1}{83}$ **(B)** $\frac{1}{8}$ **(C)** 1 **(D)** 8 **(E)** 83

---

2. If $f(2) = 3$, $f\,'(2) = 4$, and $g(x)$ is the inverse function to $f(x)$, the equation of the tangent line to $g(x)$ at $x = 3$ is:

(A) $y - 2 = -\frac{1}{4}x - 3$

(B) $y - 2 = 4(x - 3)$

(C) $y - 3 = -\frac{1}{4}x - 2$

(D) $y - 2 = \frac{1}{4}(x - 3)$

(E) $y - 3 = \frac{1}{4}(x - 2)$

---

3. If $f(x) = 3x^2 - x$, and $g(x) = f^{-1}(x)$, then $g'(10)$ could be

(A) 59 **(B)** $\frac{1}{59}$ **(C)** $\frac{1}{10}$ **(D)** 11 **(E)** $\frac{1}{11}$

---

4. Let f be a differentiable function such that $f(3) = 15$, $f(6) = 3$, $f'(3) = -8$, and $f'(6) = -2$. The function g is differentiable and $g(x) = f^{-1}(x)$ for all x. What is the value of $g'(3)$?

(A) $-\frac{1}{2}$ **(B)** $-\frac{1}{8}$ **(C)** $\frac{1}{6}$ **(D)** $\frac{1}{3}$