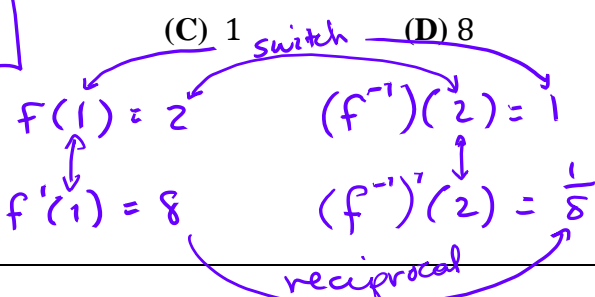


Derivatives of Inverse Functions

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:

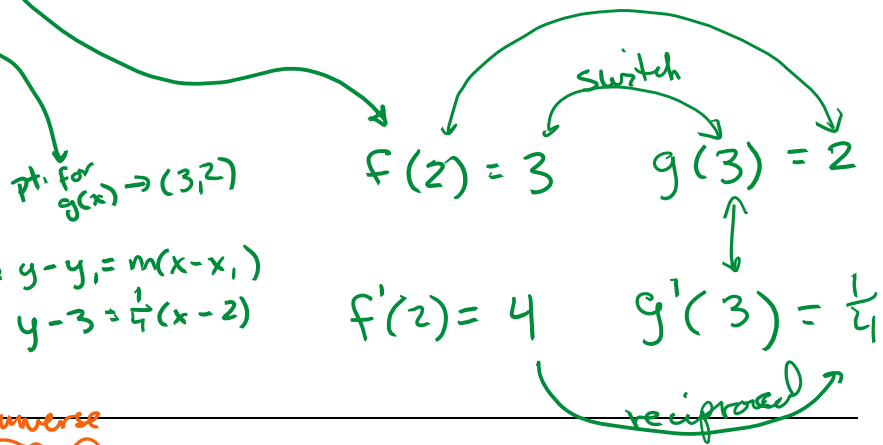
- (A) $\frac{1}{83}$ (B) $\frac{1}{8}$ (C) 1 (D) 8 (E) 83

$f(x) = x^5 + 3x - 2$
 $f'(x) = 5x^4 + 3$
 $f'(1) = 5(1)^4 + 3$



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:

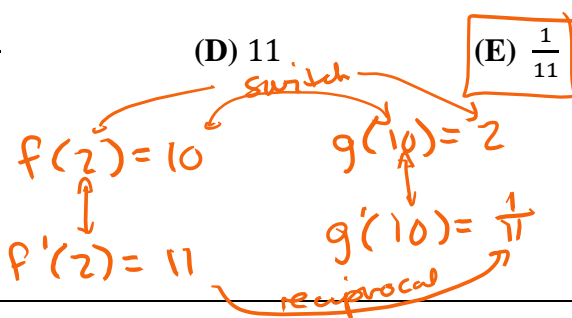
- (A) $y - 2 = -\frac{1}{4}x - 3$
 (B) $y - 2 = 4(x - 3)$
 (C) $y - 3 = -\frac{1}{4}x - 2$
 (D) $y - 2 = \frac{1}{4}(x - 3)$
 (E) $y - 3 = \frac{1}{4}(x - 2)$



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) $\frac{1}{11}$

$f(x) = 10$
 $3x^2 - x = 10 \Rightarrow 3x^2 - x - 10 = 0$
 $(3x + 5)(x - 2) = 0$
 $x = 2$
 $f'(x) = 6x - 1$
 $f'(2) = 11$



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) $\frac{1}{3}$

