AP Calculus Name_____

5.3: Derivative of inverse Functions Period____Date_____

1. If $f(x) = x^5 + x^3 + 2x - 2$, find $(f^{-1})'(2)$

2. If $f(x) = \frac{1}{2}x^3 + \frac{1}{2}$, find $(f^{-1})'(0)$.

3. If $f(x) = \frac{1}{4}x^3 + x - 1$, find $(f^{-1})'(3)$

4. If $f(x) = x^3 - 3x^2 + 8x + 5$, and $g(x) = f^{-1}(x)$, find $g'(5)$

5. If $f(x) = 2x^3 - 3x$, and h(x) is the inverse function of f(x), find $h'(-1)$, x > 1/2.

6. Given $f(3) = 15$, $f'(3) = -8$, $f(6) = 3$, and $f'(6) = -2$. If f and g are inverses, find g'(3).

7. Suppose f is differentiable with the values shown in the table.

x	$f(x)$	$f'(x)$
0	2	1
1	3	2
2	5	3
3	10	4

a. Write an equation of the tangent line to $f(x)$ at x = 3.
b. Write an equation of the normal line to $f(x)$ at x = 3.
c. Write an equation of the tangent line to $f^{-1}(x)$ at x = 3.
d. Write an equation of the normal line to $f^{-1}(x)$ at x = 3.

Answers

1 1/10
2 2/3
3 1/4
4 1/8
5 1/3
6 -1/2
7a y – 10 = 4(x – 3)
7b y – 10 = -0.25(x – 3)
7c y – 1 = ½(x – 3)
7d y – 1 = -2(x – 3)