

Name: _____

This quiz is out of 10 points. No partial credit will be given. Credit will be given based solely on your final answer. Please write your final answer on this sheet. You may perform your work on another sheet of paper. You will be given 20 minutes to complete the quiz.

1. If $f(x) = \frac{4}{x-1}$ and $g(x) = 2x$, then what is the solution set of $f(g(x)) = g(f(x))$?

2. If the function f is defined by $f(x) = x^5 - 1$, then what is $\frac{d}{dx}f^{-1}$, the derivative of the inverse function of f ?

3. What is $\lim_{h \rightarrow 0} \frac{8\left(\frac{1}{2} + h\right)^8 - 8\left(\frac{1}{2}\right)^8}{h}$?

4. What is the graph of the set of all points (e^t, t) , where t is a real number?

5. If $f(x) = 2 + |x - 3|$ for all x , then what is the value of the derivative $f'(x)$ at $x = 3$?

6. At $x = 0$, which of the following is true of the function f defined by $f(x) = x^2 + e^{-2x}$?

- a) f is increasing.
- b) f is decreasing.
- c) f is discontinuous.
- d) f has a relative minimum.
- e) f has a relative maximum.

7. If $f(x) = \tan x$, find $f'(x)$.
8. If $f'(x) = -f(x)$ and $f(1) = 1$, then what could $f(x)$ be?
9. If a, b, c, d , and e are real numbers and $a \neq 0$, then the polynomial equation $ax^7 + bx^5 + cx^3 + dx + e = 0$ has
- a) only one real root.
 - b) at least one real root.
 - c) an odd number of nonreal roots.
 - d) no real roots.
 - e) no positive real roots.
10. If $\frac{d}{dx}(f(x)) = g(x)$ and $\frac{d}{dx}(g(x)) = f(x^2)$, then $\frac{d^2}{dx^2}(f(x^3)) =$
- a) $f(x^6)$.
 - b) $g(x^3)$.
 - c) $3x^2g(x^3)$.
 - d) $9x^4f(x^6) + 6xg(x^3)$.
 - e) $f(x^6) + g(x^3)$.