

Name: _____

Key

Section: _____

You have 10 minutes to complete the quiz.

Please show all work, and then circle your final answer.

1. Let $f(x) = e^x$, $g(x) = x^2 + 3x$, and $h(x) = x^2 + 1$. Find and simplify the following functions.

(a) 2 points: $(f \circ g)(x) = f(g(x)) = e^{(g(x))} = e^{(x^2+3x)} = e^{(x^2)} \cdot e^{(3x)}$

this is what I was looking for

$(f \circ g)(x) = e^{(x^2)} \cdot e^{(3x)}$

also ok.

(b) 2 points: $(g \circ f)(x) = g(f(x)) = (f(x))^2 + 3 \cdot (f(x)) = (e^x)^2 + 3 \cdot e^x$

$(g \circ f)(x) = e^{2x} + 3e^x$

(c) 4 points: $(g \circ h)(x) = g(h(x)) = (h(x))^2 + 3(h(x)) = (x^2+1)^2 + 3(x^2+1) = x^4 + 2x^2 + 1 + 3x^2 + 3$

$(g \circ h)(x) = x^4 + 5x^2 + 4$

2. Let $f(1) = 5$, $f(5) = 6$, $f(6) = 9$, and $f(9) = 1$. Find the following (1 point each):

(a) $f^{-1}(9) = 6$

$f^{-1}(9) = x$
 \Leftrightarrow
 $9 = f(x)$

(b) $f^{-1}(6) = 5$

$f^{-1}(6) = x$
 \Leftrightarrow
 $6 = f(x)$