Quiz 4

MAC1147, PRECALC AND TRIG, SPRING 2017

SECTION: P04 / 3046
NAME: [Key]

Problem 1. What are your thoughts on the meaning of life?

There probably is no meaning, but the search for a meaning is perhaps what is most important.

Problem 2. Find the inverse of the function \( f(x) = \sqrt{4x+5} \).

If \( y = \sqrt{4x+5} \), then the inverse is \( x = \frac{y^2 - 5}{4} \), i.e., \( x^2 = 4y + 5 \), so

\( y = \frac{x^2 - 5}{4} \), with the restriction \( x > 0 \) so that the domain of \( f^{-1} \) matches the range of \( f \).

Problem 3. Let \( f(x) = x^2 \). Write the equation of the function obtained by shifting \( f \) three units to the left, reflecting over the \( y \)-axis, and then shifting one unit down. You do not need to simplify your answer.

\[
\begin{align*}
\text{1} & \quad y = x^2 \\
\text{2} & \quad (x+3)^2 \\
\text{3} & \quad (-x+3)^2 \\
\text{4} & \quad f(x) = (x+3)^2 - 1
\end{align*}
\]

Problem 4. Let \( f(x) = |x - 1| \) and let \( g(x) = 6 - x \). Find \( f \cdot g \), \( f + g \), and \( f \circ g \). You do not need to simplify your answers.

\[
\begin{align*}
(f \cdot g)(x) &= f(x) \cdot g(x) = (|x - 1|)(6 - x) \\
(f + g)(x) &= f(x) + g(x) = |x - 1| + (6 - x) \\
(f \circ g)(x) &= f(g(x)) = |(6 - x) - 1|
\end{align*}
\]