King Fahd University of Petroleum and Minerals
Prep-Year Math Program
Math (001)-Term (181)
Recitation (2. 7)

Question 1: Given $F(x)=\sqrt{1+\sqrt{x}}$, find functions f and g such that $F=f\circ g$

Answer: $f(x)=\sqrt{1+x}$ **and** $g(x)=\sqrt{x}$

Question 2: If $f(x)=x+k$, $g(x)=[\![x]\!]$ and the graph of the function $(g\circ f)(x)$ has y-intercept $=3$, then find all the values of k.

Answer: $3\le k<4$

Question 3: If $f(x)=x+4$ and $(f\circ g)(x)=12+8x+2x^2$, then $g(2)=$

(a) 4 (b) 6 (c) 36 (d) 40 (e) 32

Answer: (e) 32

Question 4: If $f(x)=\begin{cases}\left[\!\left[1-\frac{x}{3}\right]\!\right] & \text{if } x\le -3\\ 1 & \text{if } -3<x<0\\ x^2+1 & \text{if } x\ge 0\end{cases}$ and $g(x)=|1+x|$.

Then the value of $(f\circ f)\left(-\frac{7}{2}\right)+\left(\frac{f}{g}\right)\left(-\frac{7}{2}\right)=$

(a) $\frac{29}{5}$ (b) $\frac{26}{5}$ (c) $\frac{4}{5}$ (d) $\frac{39}{7}$ (e) $\frac{15}{2}$

Answer: (a): $\frac{29}{5}$

Question 5:

(a): If $f(x)=\sqrt{9-x^2}$ and $g(x)=x^2-2x-8$ then find the domain of $\left(\frac{f}{g}\right)(x)$

(b): Find the domain of $(f\circ g)(x)$, where $f(x)=\frac{x-1}{3-x}$ and $g(x)=\sqrt{x+2}$

Answer: (a): $D_{\frac{f}{g}}=[-3,-2)\cup(-2,3]$ **(b):** $D_{f\circ g}=[-2,7)\cup(7,\infty)$