5. Let $f(x)=\dfrac{x}{1+x^2}$ and $g(x)=\dfrac{1}{x+1}$. Find $f(g(x))$ and $g(f(x))$. Simplify completely.

$$f(g(x)) = \frac{\frac{1}{x+1}}{1+\left(\frac{1}{x+1}\right)^2} \cdot \frac{(x+1)^2}{(x+1)^2} = \frac{x+1}{(x+1)^2+1} = \frac{x+1}{x^2+2x+2}$$

$$g(f(x)) = \frac{1}{\frac{x}{1+x^2}+1} \cdot \frac{1+x^2}{1+x^2} = \frac{1+x^2}{x+1+x^2} = \frac{x^2+1}{x^2+x+1}$$

6. Use the table of $f(x)$ values below to match the numerical information in column A with the symbolic representation in column B. Then create a relevant table for the equation not used.

x	-4	-2	0	2	4
$f(x)$	8	2	6	4	10

Column A

x	-4	-2	0	2	4
$g(x)$	10	4	8	6	12

x	-2	-1	0	1	2
$h(x)$	8	2	6	4	10

x	-2	0	2	4	6
$k(x)$	8	2	6	4	10

x	-4	-2	0	2	4
$m(x)$	4	1	3	2	5

x	-4	-2	0	2	4
$n(x)$	-8	-2	-6	-4	-10

x	4	2	0	-2	-4
$p(x)$	8	2	6	4	10

x	7	5	3	1	-1
$q(x)$	14	8	10	6	12

x	-6	-4	-2	0	2
$r(x)$	8	2	6	4	10

Column B

(*i*) $f(x-2)$ — k

(*ii*) $\frac{1}{2}f(x)$ — m

(*iii*) $f(x)+2$ — g

(*iv*) $f(-x)$ — p

(*v*) $f(x-3)+4$ — q

(*vi*) $-f(x)$ — n

(*vii*) $f(x+2)$ — r

(*viii*) $f(2x)$ — h