MATH 125 College Algebra Name______________________________

Composite Functions

Notation: $(f \circ g)(x) = f(g(x))$ $(g \circ f)(x) = g(f(x))$ $(h \circ f \circ g)(x) = h(f(g(x)))$

$(f\ composite\ g)\ of\ x$ $(g\ composite\ f)\ of\ x$ $(g \circ h \circ f)(x) = g(h(f(x)))$

$f(x) = \sqrt{x-1}$ $g(x) = x^2$

Domain of f : $\{x \mid x \geq 1\}$ $[1, \infty)$ *Domain of* g : *All* Real *Numbers*

$(f \circ g)(5) =$

$(f \circ g)(x) =$

$(g \circ f)(5) =$

$(g \circ f)(x) =$

$\text{h}(x) = \dfrac{1}{x} = x^{-1}$ $k(x) = \dfrac{2}{x+1}$

Domain of h : $\{x \mid x \neq 0\}$ *Domain of* k : $\{x \mid x \neq -1\}$

$(h \circ k)(2) =$

$(h \circ k)(x) =$

$(k \circ h)(2) =$

$(k \circ h)(x) =$

$f(x) = \dfrac{1}{x-1}$ $h(x) = x^2$ $g(x) = 4x+1$

Domain of f : $\{x \mid x \neq 1\}$ *Domain of* h : *All* Real *Numbers* *Domain of* g : *All* Real *Numbers*

$(h \circ g \circ f)(5) = h(g(f(5)))$

$(h \circ g \circ f)(x) = h(g(f(x)))$

Determine f and g under the condition that

$h(x) = (f \circ g)(x)$ *and* $h(x) = (5x+2)^3$

$f(x) =$ ____________

$g(x) =$ _____________

Determine f *and* g *under the condition that*

$h(x) = (f \circ g)(x)$ *and* $h(x) = \sqrt{3x-1}$

$f(x) =$ ____________

$g(x) =$ _____________

$R(x) = \dfrac{x}{x+1}$ $\qquad$ $T(x) = \dfrac{x-1}{x}$

Domain of R : $\{\ x \mid x \neq -1\ \}$ $\qquad$ *Domain of* T : $\{\ x \mid x \neq 0\ \}$

$(\ -\infty\ ,\ -1\ ) \cup (\ -1\ ,\ \infty\ )$ $\qquad$ $(\ -\infty\ ,\ 0\ ) \cup (\ 0\ ,\ \infty\ )$

Domain of $R+T\ ,\ R\cdot T\ ,\ R-T$:

Domain of $\dfrac{R}{T}$: ______________________ *Domain of* $\dfrac{T}{R}$: ______________________

$(R+T)(x)=$______________________ $(R-T)(x)=$______________________

$(R\cdot T)(x)=$______________________

$\dfrac{R}{T}$ =______________________ $\dfrac{T}{R}$ =______________________

$P(x) = \sqrt{x}$ $\qquad$ $Q(x) = \sqrt{4-x}$

Domain of $P(x)$: $\{\ x \mid x \geq 0\ \}$ $\qquad$ *Domain of* $Q(x)$: $\{\ x \mid x \leq 4\ \}$

$[\ 0,\ \infty\ )$ $\qquad$ $(\ \infty,\ 4\ ]$

Domain of $(P+Q)(x),\ (P\cdot Q)(x),\ (P-Q)(x),\ (P-Q)(x)$: ______________________

Domain of $\dfrac{P}{Q}$: ______________________ *Domain of* $\dfrac{Q}{P}$: ______________________

$(P+Q)(x)=$______________________ $(P-Q)(x)=$______________________

$(P\cdot Q)(x)=$______________________

$\dfrac{P}{Q}$ =______________________ $\dfrac{Q}{P}$ =______________________