Quiz4, MAT1375 Professor Chiu

ID:_____ Name: Sol

- This quiz consists of 7 questions for a total of 10 points.
- You have 10 minutes to complete the quiz.
- Wishing you success.

(5 points)True or False questions:

1. T Let $f(x) = 7\sqrt{x}$ and $g(x) = 5\sqrt{x}$. Then the domain of $(f+g)(x)$ is $[0, \infty)$.
2. T Let $f(x) = 3x + 6$ and $g(x) = 2x - 8$. Then the domain of $\left(\frac{f}{g}\right)(x)$ is $(-\infty, 4) \cup (4, \infty)$.
   ↳ $g(x) \neq 0 \Rightarrow 2x - 8 \neq 0 \Rightarrow x \neq 4$
3. T Let $f(x)$ and $g(x)$ be two functions. Then $D_{f-g} = D_f \cap D_g$.
4. T The composition of the function f with function g is defined by $(f \circ g)(x) = f(g(x))$.
5. F Let $f(x)$ and $g(x)$ be two functions. Then $(f \circ g)(x) = (g \circ f)(x)$.

Show all your work and justify your answer:

(3 points)6. Let $f(x) = \frac{4}{x+2}$ and $g(x) = x^2 - 3x$. Find $(f \circ g)(x)$ and state its domain.

$(f \circ g)(x) = f(g(x)) = \frac{4}{g(x)+2} = \frac{4}{x^2-3x+2}$

To find its domain, it starts with $\mathbb{R}$ but $x^2 - 3x + 2 \neq 0$.

Then $x^2 - 3x + 2 = (x-1)(x-2) \neq 0 \Rightarrow (x-1) \neq 0$ and $(x-2) \neq 0$

$x \neq 1$ $\quad x \neq 2$

$\Rightarrow x \neq 1$ and $x \neq 2$

Thus, its domain is $\mathbb{R} - \{1, 2\}$ or $(-\infty, 1) \cup (1, 2) \cup (2, \infty)$

or $\{x \in \mathbb{R} \mid x \in (-\infty, 1) \cup (1, 2) \cup (2, \infty)\}$

Please turn over and finish the rest of the question.

(2 points)7. Given two functions f and g by the tables:

x	1	2	3	4	5	6
$f(x)$	3	1	2	5	6	3

x	1	2	3	4	5	6
$g(x)$	5	2	6	1	2	4

Please use the information from the table of f and g to complete the following table:

x	1	2	3	4	5	6
$(g \circ f)(x)$	6	5	2	2	4	6

$g(f(x))$

$g(f(1)) = g(3) = 6$

$g(f(2)) = g(1) = 5$

$g(f(3)) = g(2) = 2$

$g(f(4)) = g(5) = 2$

$g(f(5)) = g(6) = 4$

$g(f(6)) = g(3) = 6$

End of this quiz.