ID:_____   Name:___Sol_____

- This quiz consists of 2 questions, each worth 5 points, for a total of 10 points.
- You have 15 minutes to complete the quiz.
- Show all work and justify your answers.
- Scientific calculators are allowed.
- Wishing you success.

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

① $(f \circ g)(x) = f(g(x))$

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

② For the domain of this composition function,

We start it from the domain of g: $D_g = (-\infty, \infty)$

Because $(f \circ g)$ is a fraction, the denominator part can't

be zero: $x^2 - 3x + 2 \neq 0 \Rightarrow (x-1)(x-2) \neq 0$

$\Rightarrow x - 1 \neq 0$ and $x - 2 \neq 0$

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

$\boxed{D_{f \circ g}: (-\infty, 1) \cup (1, 2) \cup (2, \infty)}$

Please turn over for the next question.

2. 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

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

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

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

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

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

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

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