

YOUR NAME: \_\_\_\_\_

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Read each problem **very carefully** before starting to solve it and do only what is asked. Each problem is worth around 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. [3 points] Let  $f(x) = \frac{1}{x^2 - 4}$  and  $g(x) = x + 2$ . Find a formula for  $(f \circ g)(x)$  and simplify.

2. [2 points] The functions  $f$  and  $g$  are specified via the following table:

$x$	$f(x)$	$g(x)$
0	2	7
1	5	4
2	3	2
3	1	3
4	7	1
5	4	0

Compute the following values showing all steps:

$$f(g(4)) =$$

$$g(f(5)) =$$

3. [5 points] Suppose  $f(x) = \frac{1}{x+5}$  and  $g(x) = \frac{1}{2-x}$ . (In answering the questions below, show all steps!)

(a) Find the domain of  $f$ .

(b) Find the domain of  $g$ .

(c) Clearly state the conditions that need to be imposed and solve them to find the domain of  $f \circ g$ .