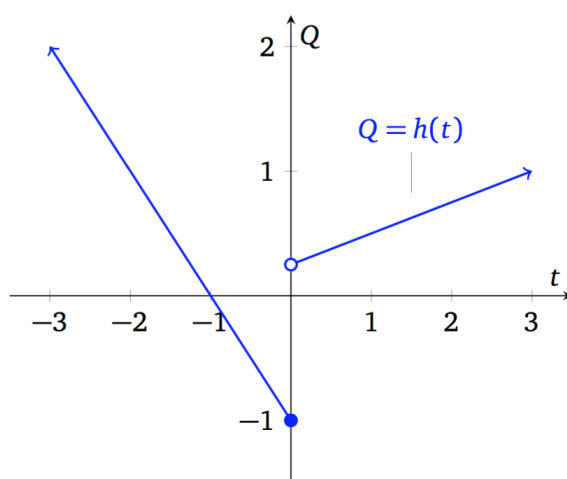


Quiz 4

Name: _____

1. Given the functions $h(t)$ and $g(t)$, compute the following quantities.

t	$g(t)$
-1	1
0.25	-1
0	1
1	-3
2	-1



(a) [2 pts] $(g \cdot h)(-1) = 0$

(c) [2 pts] $(g \circ h)(0) = 1$

(b) [2 pts] $(g \circ g)(2) = 1$

(d) [2 pts] $(h \circ g \circ h)(3) = 2$

2. Let $f(x) = 2x^2 - 5$ and $g(x) = \frac{1}{x}$.

(a) [3 pts] Find a formula for $(g \circ f)(x)$. (b) [3 pts] Find a formula for $(f \circ g)(x)$.

$$(g \circ f)(x) = \frac{1}{f(x)} = \frac{1}{2x^2 - 5}$$

$$(f \circ g)(x) = 2(g(x))^2 - 5 = 2\left(\frac{1}{x}\right)^2 - 5 = \frac{2}{x^2} - 5$$

3. Let $g(x) = \sqrt{x-1}$ and $f(x) = \frac{2}{x}$.

(a) [3 pts] Find a formula for the composition $g \circ f$.

$$(g \circ f)(x) = \sqrt{\frac{2}{x} - 1}.$$

(b) [3 pts] What is the domain of $g \circ f$?

First kick out things not in the domain of f , which is $x = 0$. Then, for $g \circ f$ to make sense, we need $\frac{2}{x} - 1 \geq 0$, or $\frac{2}{x} \geq 1$. This happens when $x \leq 2$ as x must already be positive. So, the domain is $(0, 2]$.