

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

1. Using the table above, evaluate the following:

(a)  $f(h(f(1))) \div (f \circ g)(2)$

(c)  $g(f(3)) - h(h(2))$

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

(d)  $(f \circ g)(h(f(4)))$

2. From the graphs of  $f$ ,  $g$ , and  $h$  above, estimate the value of  $g(f(h(x)))$  for  $\{x \in \mathbb{Z} \mid -3 \leq x \leq 3\}$ .

3. From the graphs of  $f$  and  $g$  above, evaluate each expression:

(a)  $f(h(f(1))) \div (f \circ g)(2)$

(c)  $g(f(3)) - h(h(2))$

(e)  $g(f(3)) - h(h(2))$

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

(d)  $(f \circ g)(h(f(4)))$

(f)  $(f \circ g)(h(f(4)))$

4. For each part, find the following functions and their domains:  $(f \circ g)$ ,  $(g \circ f)$ ,  $(f \circ f)$ , and  $(g \circ g)$ .

(a)  $f(x) = \tan(x)$ ,  $g(x) = \sin(x)$

(c)  $f(x) = \tan(x)$ ,  $g(x) = \sin(x)$

(b)  $f(x) = \tan(x)$ ,  $g(x) = \sin(x)$

(d)  $f(x) = \tan(x)$ ,  $g(x) = \sin(x)$

5. Find  $f \circ g \circ h$ .

(a)  $f(x) = \tan(x)$ ,  $g(x) = \sin(x)$ ,  $h(x) = \sin(x)$

(b)  $f(x) = \tan(x)$ ,  $g(x) = \sin(x)$ ,  $h(x) = \sin(x)$

(c)  $f(x) = \tan(x)$ ,  $g(x) = \sin(x)$ ,  $h(x) = \sin(x)$

(d)  $f(x) = \tan(x)$ ,  $g(x) = \sin(x)$ ,  $h(x) = \sin(x)$

6. Express each function in the form  $f \circ g$ :

(a)  $f(x) = \tan(x)$ ,  $g(x) = \sin(x)$

(c)  $f(x) = \tan(x)$ ,  $g(x) = \sin(x)$

(b)  $f(x) = \tan(x)$ ,  $g(x) = \sin(x)$

(d)  $f(x) = \tan(x)$ ,  $g(x) = \sin(x)$

7. From the graphs