

6. (10 points)

(a) Suppose that $h(x) = g(f(x))$. Fill in the missing values based on the information given in the table:

x	1	2	3
$f(x)$	-1	1	3
$g(x)$	$2/3$	$4/3$	$8/3$
$h(x)$	$1/6$	$2/3$	$8/3$

(b) Which, if any, of f , g and h could be linear functions? Show evidence for your choice(s).

The function f could be linear, because the rates of change are constant:

$$\frac{3 - 1}{3 - 2} = \frac{1 - (-1)}{2 - 1} = 2.$$

(c) Which, if any, of f , g and h could be exponential functions? Show evidence for your choice(s).

The functions g and h could be exponential, because the percent rates of change are constant. For Δx consistently one, we have

$$\text{for } g(x) : \frac{8/3}{4/3} = \frac{4/3}{2/3} = 2$$

$$\text{and for } h(x) : \frac{8/3}{2/3} = \frac{2/3}{1/6} = 4.$$