

Exam 1 Review Problems, 1

1. Let $f(x) = \sin(x)$, $g(x) = \sqrt{x-1}$ and $h(x) = \frac{1}{x}$. Find each of the following compositions, and state the domain in the first three cases.

(a) $f \circ f$

(b) $g \circ g$

(c) $g \circ h$

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

2. Suppose that a cantaloupe is thrown in such a fashion that it travels $2t^2 + t$ meters after t seconds have passed.

(a) Find the average velocity of the cantaloupe on the time interval $[1, 2]$.

(b) Find the average velocity of the cantaloupe on the time interval $[1, 1.5]$.

(c) Find the average velocity of the cantaloupe on the time interval $[1, 1.1]$.

(d) What do you think the *instantaneous velocity* of the cantaloupe is at the time $t = 1$?