AP Calculus AB

Week 7 FRQ

Name: _____

1) A particle moves along the x-axis with a velocity function of $v(t) = 1 + 2\sin\left(\frac{t^2}{2}\right)$.

a) Find the acceleration function $a(t)$.

b) Find the acceleration at time $t=4$. Is the particle speeding up or slowing down?

c) When is the particle not moving at all?

2) Water is pumped into a tank, and as time goes by, the rate is changing according to the values in the table.

t (hrs.)	0	1	3	6	8
R(t) L/hr.	1340	1190	950	740	700

a) Estimate $R'(2)$.

b) Estimate $R'(4)$.

c) What does $R'(4)$ represent?

3)

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
1	-6	3	2	8
2	2	-2	-3	0
3	8	7	6	2
6	4	5	3	-1

a) Find $h'(2)$ if $h(x) = g(x) + f(x)g(x) + \frac{f(x)}{g(x)}$.

b) Let $h(x) = f(g(x))$. Find $h'(1)$.

c) Let $h(x) = f(g(x))$. Write an equation for the line tangent to the graph of h at $x=3$.