

Name: _____

Quiz 2, section 2.1

1. (5 pts) Use the following table of average velocities to estimate the instantaneous velocity at time $t = 3.875$.

interval	avg vel	interval	avg vel
[3.875, 4]	105.3109375	[3.75, 3.875]	98.6265625
[3.875, 3.9]	102.6026875	[3.8, 3.875]	99.9404375
[3.875, 3.88]	102.0665575	[3.87, 3.875]	101.7991825
[3.875, 3.876]	101.9595523	[3.874, 3.875]	101.9060773

trend is down trend is up

expect $101.906... \leq v_{inst} \leq 101.959...$

say $v_{inst} \approx 101.93$

2. (5 pts) A rock thrown from the surface of Mars has height $h(t) = 10 - 1.86t^2$. Compute the average velocity over the time intervals $[2, 2.1]$, $[2, 2.01]$, and $[2, 2.001]$. Use that data to estimate the instantaneous velocity at time $t = 2$.

$$h(2) = 10 - 1.86(2)^2 = 2.56$$

$$h(2.1) = 10 - 1.86(2.1)^2 = 1.7974$$

$$h(2.01) = 10 - 1.86(2.01)^2 = 2.485414$$

$$h(2.001) = 10 - 1.86(2.001)^2 = 2.55255814$$

$[2, 2.1]$	$\frac{1.7974 - 2.56}{2.1 - 2} = -7.626$
$[2, 2.01]$	$\frac{2.485414 - 2.56}{2.01 - 2} = -7.4586$
$[2, 2.001]$	$\frac{2.55255814 - 2.56}{2.001 - 2} = -7.44186$

it seems $v_{inst} = -7.44$

↳ minus means down