

What month is your birthday? _____
 What are the first 2 digits of your address? _____
 What are the last 2 digits of your zip code? _____
 What are the last 2 digits of your social security number? _____
[IF YOU DO NOT HAVE A SOCIAL SECURITY NUMBER, USE YOUR STUDENT ID NUMBER]

SCORE: ____ / 10 POINTS

If an arrow is fired upward with a velocity of 56 m/s, its height in meters t seconds later is given by $y = 56t - 4.9t^2$.

SCORE: ____ / 3 POINTS

★ USE FORMULA $\frac{56x - 4.9x^2 - 157.5}{x - 5}$ WITH $x = 5.1$
 5.02
 5.004
 5.0008

[a] [FILL IN THE TABLE] Find the average velocity for the time period beginning when $t = 5$ and lasting

	time period lasting			
	0.1 second	0.02 second	0.004 second	0.0008 second
average velocity	6.51 $\frac{1}{2}$	6.902 $\frac{1}{2}$	6.9804 $\frac{1}{2}$	6.9961 $\frac{1}{2}$
	rounded to 4 decimal places			

[b] [FILL IN THE BLANK] The instantaneous velocity at $t = 5$ is 7 $\frac{1}{2}$.

The point $P(4, 2)$ lies on the curve $y = \frac{\sqrt{x}}{x-3}$.

★ USE FORMULA $\frac{\frac{\sqrt{x}}{x-3} - 2}{x-4}$

SCORE: ____ / 5 POINTS

[a] [FILL IN THE TABLE] If Q is the point $\left(x, \frac{\sqrt{x}}{x-3}\right)$, find the slope of the secant line PQ for the following values of x :

	$x = 4.3$	$x = 4.03$	$x = 4.003$	$x = 3.7$	$x = 3.97$	$x = 3.997$
slope of secant line	-1.35 $\frac{1}{2}$	-1.699 $\frac{1}{2}$	-1.745 $\frac{1}{2}$	-2.493 $\frac{1}{2}$	-1.804 $\frac{1}{2}$	-1.755 $\frac{1}{2}$
	rounded to 4 decimal places					

[b] [FILL IN THE BLANK] The slope of the tangent line at P is -1.75 $\frac{1}{2}$.

[c] [FILL IN THE BLANK] The equation of the tangent line at P (in point-slope form) is $y - 2 = -1.75(x - 4)$.

The table below shows the value of a function $y = f(x)$.

SCORE: ____ / 2 POINTS

x	0	4	8	12	16	20
$f(x)$	37	29	22	17	13	11

Estimate the slope of the tangent line at $P(8, 22)$ by averaging the slopes of two appropriate secant lines.

SHOW YOUR CALCULATIONS.

$\frac{1}{2} \left(\frac{22 - 29}{8 - 4} \right) = -\frac{7}{4} \frac{1}{4}$
 $\frac{1}{2} \left(\frac{17 - 22}{12 - 8} \right) = -\frac{5}{4} \frac{1}{4}$
 $\frac{1}{2} \left(-\frac{7}{4} + -\frac{5}{4} \right) = -\frac{3}{2}$ or -1.5
 EITHER ONE