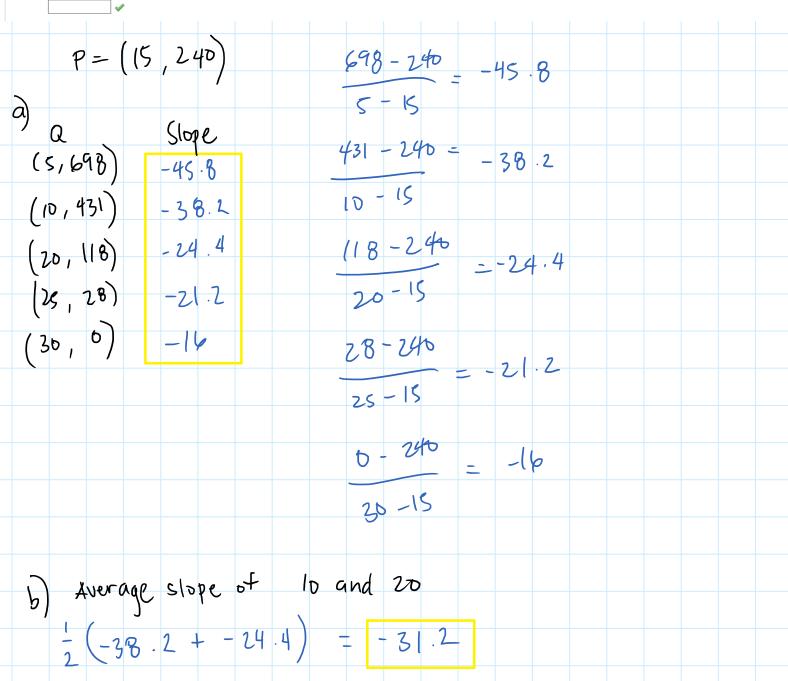
A tank holds 1000 gallons of water, which drains from the bottom of the tank in half an hour. The values in the table show the volume V of water remaining in the tank (in gallons) after t minutes.

t (min)	5	10 15		20	25	30
V (gal)	698	431	240	118	28	0

(a) If P is the point (15, 240) on the graph of V, find the slopes of the secant lines PQ when Q is the point on the graph with the following values. (Round your answers to one decimal place.)

Q	slope
(5, 698)	✓
(10, 431)	✓
(20, 118)	✓
(25, <mark>28</mark>)	✓
(30, 0)	✓

(b) Estimate the slope of the tangent line at P by averaging the slopes of two adjacent secant lines. (Round your answer to one decimal place.)



A cardiac monitor is used to measure the heart rate of a patient after surgery. It compiles the number of heartbeats after t minutes. When the data in the table are graphed, the slope of the tangent line represents the heart rate in beats per minute.

t (min)	36	38	40	42	44
Heartbeats	2513	2655	2788	2918	3058

The monitor estimates this value by calculating the slope of a secant line. Use the data to estimate the patient's heart rate after 42 minutes using the secant line between the points with the given values of t. (Round your answers to one decimal place.)

- (a) t = 36 and t = 42
- (b) t = 38 and t = 42
- (c) t = 40 and t = 42
- (d) t = 42 and t = 44
- $a) \frac{2918 2513}{42 36} = 67.5$
- b) 2918 2655 42 - 38 = 65.8
- c) $\frac{2918 2788}{42 40} = 65$
- $\frac{3058 2918}{44 42} = 70$

	Q3.1										
	Wednesday	, August 19, 2020	3:06 PM								
		rrown into the air with a Find the average velocity (i) 0.5 seconds ft/s (ii) 0.1 seconds			-						
		(iii) 0.05 seconds ft/s (iv) 0.01 seconds ft/s									
	(b)	Estimate the instantaneo	ous velocity w	hen $t = 2$.							
				t =	2 ->	t = .	2 + h,	whe	re	h ≠ 0 hifferen	
							h	, = tiv	ne d	liff even	re
Averac	je Vela	outy (Ay)) = 4	(2+ 2+h)	h)-	4(2)	PI	y =	: 38 6	16t 4() fun	2 ction
					~) - 16					_	
					2+6)				.7		
			_		-16(h	1					
			- 7	6+ 38h	- 16h2	- 64h	-64	76+	64		
			2	16h2 -	26h	= <u>K</u>	(-16h	- 2,6)	_		
Y	verage	Velocity	1 = -1	16h-	-26	_					

Q3.2
Wednesday, August 19, 2020 3:06 PM
Average Velocity = 16h-26
i) 6.5 seconds
-16(0.5) - 26 = -34 ft/s
i) o.1 seconds
- 16(01)-26 = -27.6 ft/s
iii) 6.05 seconds
-16(6.05)-26 = -24.8ft/s
TV) 0.01 Seconds
-16(0.01) - 26 = -26.16
-16(0.01) - 20 = 22.18
b) $t=2$ $A.V.$
2 > 2.1 - 27.6 ft/s
2 -> 2.05 \ - 26.8 ft/s
2 7 2.01 \ - 26.16 ft/s
t = 2

