AP Calculus Name _____

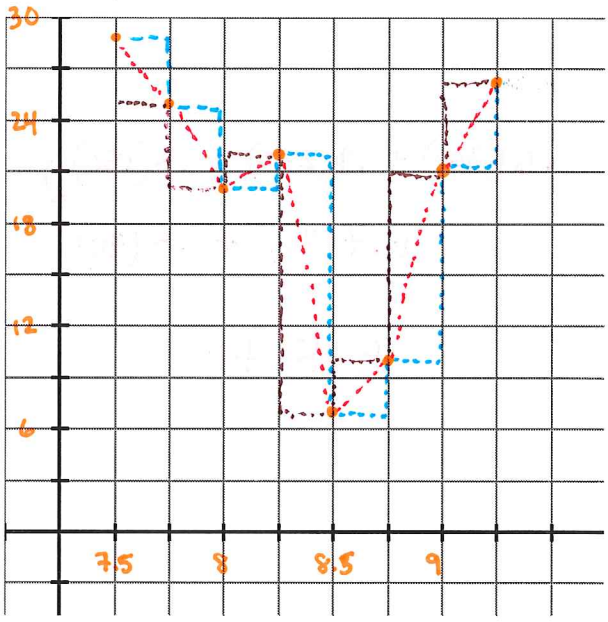
Exploration Accumulation from a Table

1. On a ship at sea, it is easier to measure how fast you are going than it is to measure how far you have gone. Suppose you are a navigator aboard a supertanker. At 7:30 you are 110 miles from the port you left from. The speed of the ship is measured each 15 minutes and recorded in the table below.

Time	mi/hr
7:30	28
7:45	25
8:00	20
8:15	22

Time	mi/hr
8:30	7
8:45	10
9:00	21
9:15	26

(a) Make a plot of the data on the grid below. Be sure to think about units.



(b) Estimate the distance the ship is from port (the ships position) every 15 minutes from 7:30 pm and 9:15 pm. Explain your answer.

····· = 110 + 7 + 6.25 + 5 + 5.5 + 1.4 + 2.5 + 5.25

- - - - = 110 + 6.25 + 5 + 5.5 + 1.4 + 2.5 + 5.25 + 6.5

····· = 110 + 6.625 + 5.625 + 5.25 + 3.45 + 1.95 + 3.875 + 5.875

Notes

t (seconds)	$v(t)$ (ft per sec)
0	0
15	30
25	70
45	60
50	72

2. The velocity of a car, in ft/sec, traveling on a straight road, for $0 \le t \le 50$ seconds, is given above in a table of values for $v(t)$. Estimate with a trapezoidal sum the distance the car traveled in 50 seconds using the intervals indicated by the table. Show how you arrived at your answer.

$\frac{15}{2}[0+30] + \frac{10}{2}[30+70] + \frac{20}{2}[70+60] +$

$\frac{5}{2}[60+72]$

$225 + 500 + 1300 + 330$

2355 ft

t (seconds)	$v(t)$ (ft per sec)
0	300
0.6	230
1.5	150
1.8	90
2.5	40
3.0	0

3. In 1993, Kara Hultgreen became one of the first female pilots authorized to fly navy planes in combat. Assume that as she comes in for a landing on the carrier, her speed in feet per second takes on the values shown in the table. Find, approximately, how far her plane travels as it comes to a stop. Is her plane in danger of running off the other end of the 800-ft-long flight deck? Justify your answer.

$.6(300) + .9(230) + .3(150)$

$+ .7(90) + .5(40)$

515 ft