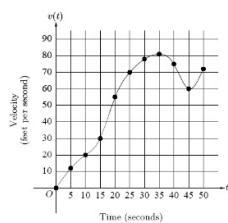


September 10

SWBAT:

Use calculus to interpret the position, velocity and acceleration.



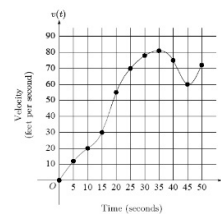
t (seconds)	$v(t)$ (feet per second)
0	0
5	12
10	20
15	30
20	55
25	70
30	78
35	81
40	75
45	60
50	72

$[0, 35]$
 $[45, 50]$
 $0 \leq t \leq 35$

3. The graph of the velocity $v(t)$, in ft/sec, of a car traveling on a straight road, for $0 \leq t \leq 50$, is shown above. A table of values for $v(t)$, at 5 second intervals of time t , is shown to the right of the graph.

(a) During what intervals of time is the acceleration of the car positive? Give a reason for your answer.

Velocity has a positive slope
velocity is increasing

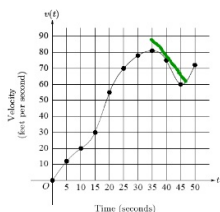


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(b) Find the average acceleration of the car, in ft/sec^2 , over the interval $0 \leq t \leq 50$.

$$\frac{v(50) - v(0)}{50 - 0} = \frac{72 - 0}{50 - 0} = \frac{72}{50} \text{ ft/sec}^2$$



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5	12
10	20
15	30
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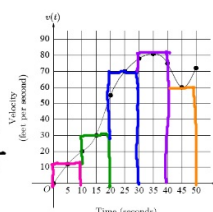
3. The graph of the velocity $v(t)$, in ft/sec, of a car traveling on a straight road, for $0 \leq t \leq 50$, is shown above. A table of values for $v(t)$, at 5 second intervals of time t , is shown to the right of the graph.

- (c) Find one approximation for the acceleration of the car, in ft/sec^2 , at $t = 40$. Show the computations you used to arrive at your answer.

$$\frac{81-60}{35-45} = \frac{21}{-10} \quad \frac{81-75}{35-40} = \frac{6}{-5}$$

$$\frac{75-60}{40-45} = \frac{15}{-5} = -3$$

$$\frac{\text{ft}}{\text{s}}(\text{s}) = \text{ft}$$



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25	70
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35	81
40	75
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50	72

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- (d) using the midpoints of five subintervals of equal length. Using correct units, explain the meaning of this integral.

int	x	y	width	Area
0 → 10	5	12	10	120
10 → 20	10	30	10	300
20 → 30	15	70	10	700
30 → 40	20	81	10	810
40 → 50	25	60	10	600

2530 ft

total distance traveled
over the first 50 sec.