

# September 7

## SWBAT:

Use calculus to interpret the position, velocity and acceleration.

Given velocity, how do you know when the acceleration is positive? negative?

The acceleration is positive when velocity is increasing.

The acceleration is negative when velocity is decreasing.

Given velocity, how can you find the average acceleration? on  $[a, b]$

$$\frac{v(b) - v(a)}{b - a} \quad \text{slope through 2 points}$$

Given velocity, how can you find the instantaneous acceleration at a point?

find the derivative of velocity ( $v'(t) = a(t)$ ) and plug in the value

Given a table of values for velocity, how can you approximate the instantaneous acceleration at a point?

find the slope through 2 points near the desired value

t	v(t)
0	6
2	8
7	15
10	16

approximate the acceleration at  $t = 7$

$$\frac{16 - 8}{10 - 2} = \frac{8}{8} = 1 \quad \frac{15 - 8}{7 - 2} = \frac{7}{5}$$
$$\frac{16 - 15}{10 - 7} = \frac{1}{3}$$