3.4 Derivative Applications

Standards:

MCD1c

MCD1e

Old Slopes of tangent line

To find the slope of the tangent of a function at one point, one must:

      1. Find the derivative of the function
      2. Substitute the point into the derivative.

new Derivative Applications

Velocity/Acceleration Relative to Derivative

Let's call the initial function, $f(x) \longrightarrow$ the "position function".

<u>Velocity</u> is the <u>speed</u> & <u>direction</u> of an object.
The rate of change of the position function is the velocity function. $\longrightarrow$ which is the derivative of the position function, $f'(x)$.
<u>note:</u> velocity is positive (forward), velocity is negative (backward)

<u>Acceleration</u> is the rate at which an object speeds up & slows down.
The rate of change of the velocity function is the acceleration function. $\longrightarrow$ which is the derivative of velocity, $f''(x)$.

note: acceleration is positive (speeding up), acceleration is negative (slowing down)

Summary

$f(x) \longrightarrow$ position function — $p(x)$.

$f'(x) \longrightarrow$ velocity function — $V(x)$

$f''(x) \longrightarrow$ acceleration function — $a(x)$.