

2.4 Derivative Applications

Standards:

MCD1c

MCD1e



Old Slopes of tangent lines

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, $f(x)$ → the "position function".

Velocity is the speed & direction of an object.

The rate of change of the position function is the velocity function. → which is the derivative of the position function, $f'(x)$.

note: velocity is positive (forward), velocity is negative (backward)

Acceleration is the rate at which an object speeds up & slows down.

The rate of change of the velocity function is the acceleration function → which is the derivative of velocity, $f''(x)$.

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

Summary

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

$f'(x) \rightarrow$ velocity function — $v(x)$

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