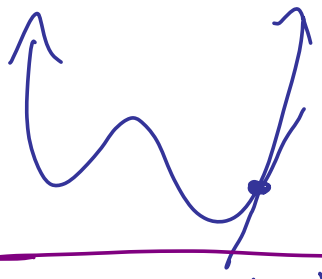
Slope of Secant Line $= \dfrac{f(x+h)-f(x)}{h}$

Slope of tangent line $= \lim_{h\to 0} \dfrac{f(x+h)-f(x)}{h}$

$f'(x)$ = Slope of tangent line.



Average Rate of Change $= \dfrac{f(x+h)-f(x)}{h}$

Instantaneous Rate of Change $= \lim_{h\to 0} \dfrac{f(x+h)-f(x)}{h}$

Average Speed $= \dfrac{\text{Distance}_{END} - \text{Distance}_{start}}{\text{Time}_{END} - \text{Time}_{START}}$

Speed average over a period of time.

Instantaneous Speed - speed at a particular time
speed when looking at speedometer.

Instantaneous speed $= \lim_{h\to 0} \dfrac{f(x+h)-f(x)}{h} = f'(x)$

P. 669
(30) $s(t)$ = displacement or position or distance

$s = 20 + 60t - 4.9t^2$

$v = \dfrac{ds}{dt}$ or $s'(t)$ = Instantaneous velocity

$\dfrac{ds}{dt} = 0 + 60 - 9.8t = 60 - 9.8t$

(36) $s = 8t^2 - 10t + 6$ $\quad t = 5$ | $t = 0$

$v = \frac{ds}{dt} = 16t - 10$

$v(5) = 16(5) - 10 = 70$

$v(0) = -10$

Initial speed (Backwards)

(26) $y = 3x^3 - 9x \quad (x = 1)$

$m_{tangent}$ or $m_{tan} = f'(x)$ or y' or $\frac{dy}{dx}$

$m_{tan} = y' = 9x^2 - 9$

$y'(1) = 9(1) - 9 = 0$

(38) find a if $y = ax^2 + 2x$ has tangent slope of -4 at $x = 2$.

$y' = \frac{dy}{dx} = 2ax + 2$

$m = -4 \quad x = 2$

$-4 = 2a(2) + 2$

$-2 \quad\quad -2$

$\frac{-6}{4} = \frac{4a}{4}$

$a = -\frac{3}{2}$

$y = -\frac{3}{2}x^2 + 2x$

p. 669-670: 25-35 odd, 37, 39, 41, 43, 45, 47

25-47 odd.