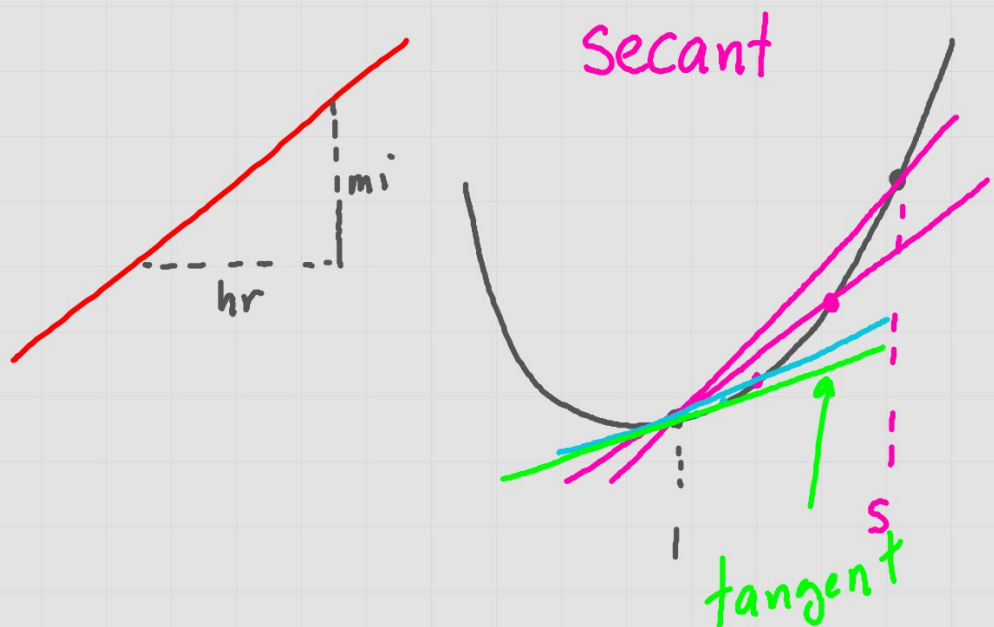
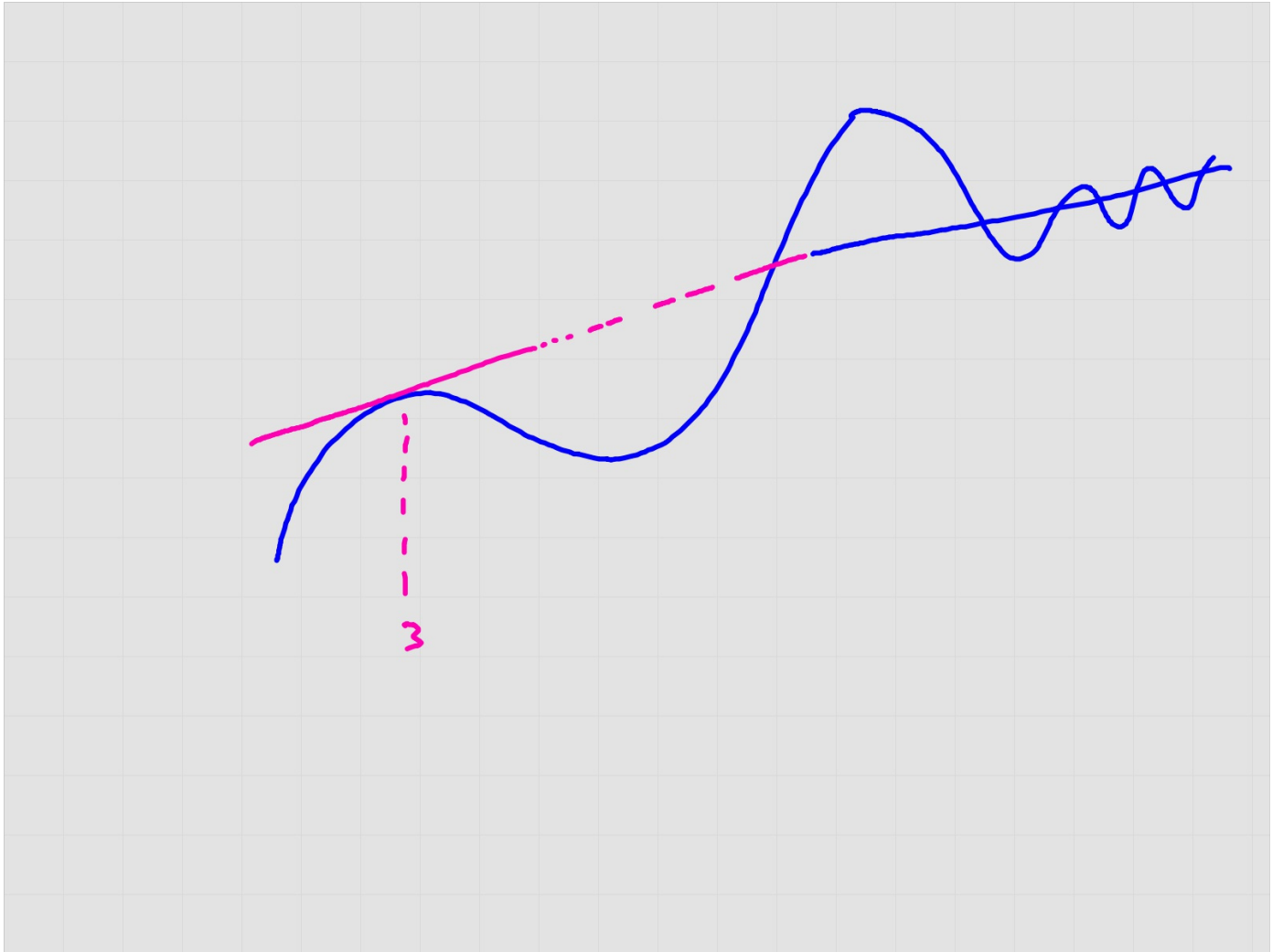


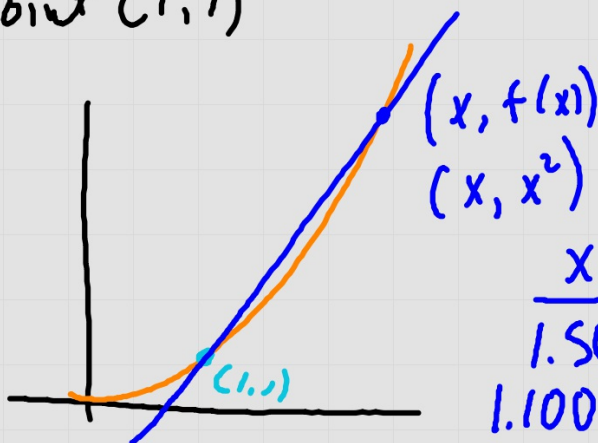
The Tangent and Velocity Problem





Write eq. of tan. to $f(x) = x^2$ at $x = 1$.

Point $(1, 1)$



$$m = \frac{x^2 - 1}{x - 1}$$

<u>x</u>	<u>m</u>	<u>x</u>	<u>m</u>
1.500	2.500	.500	1.500
1.100	2.100	.900	1.900
1.010	2.010	.990	1.990
1.001	2.001	.999	1.999

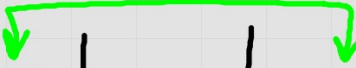
$$\lim_{x \rightarrow 1} \frac{x^2 - 1}{x - 1} = 2 \quad \rightarrow \underline{m=2}$$

↙

$$\lim_{x \rightarrow 1^+} \frac{x^2 - 1}{x - 1} = 2$$

$$\lim_{x \rightarrow 1^-} \frac{x^2 - 1}{x - 1} = 2$$

$$\therefore y - 1 = 2(x - 1)$$



x	0	.100	.200	.300	.500
y	3.860	3.710	3.400	3.020	1.960

Write eq of tan at $x = .200$

$$m = \frac{3.020 - 3.710}{.300 - .100} = -2.400$$

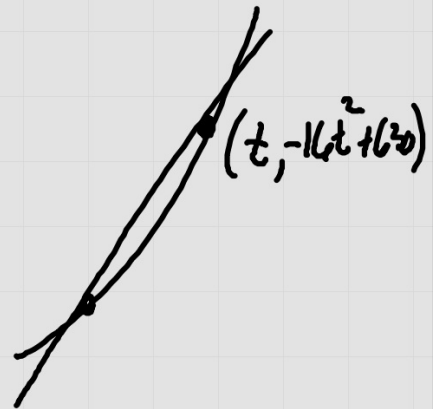
$$\therefore y - 3.400 = -2.400(x - .200)$$

$$s(t) = -16t^2 + 630$$

Int. Vel at $t=3$

$$s(3) = 486 \rightarrow (3, 486)$$

$$m = \frac{-16t^2 + 630 - 486}{t - 3}$$



t	m
3.500	
3.100	
3.010	
3.001	

t	m
2.500	
2.900	
2.990	
2.999	

$\therefore$ vel at $t=3$

is _____ ft/sec.

