

### Rates of Change in Exponential & Logarithmic Functions

Dec 12/2016

Average Rate of Change  $\Rightarrow m_{\text{secant}} = \frac{f(x_2) - f(x_1)}{x_2 - x_1}$

Estimate of Instantaneous Rate of Change  $\Rightarrow m_{\text{tangent}} = \frac{f(a+h) - f(a)}{h}$

Assigned Work:

p.507 # 4, 7, 11abc

cb

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4.  $A = A_0(1+i)^n$   
 $A(t) = 6000(1+0.075)^t$   
 ↑ interest per year  
 ← # of years

at  $t=10$ , iRoc = ?

$$iRoc = \frac{f(x+h) - f(x)}{h}$$


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$$iRoc = \frac{A(t+h) - A(t)}{h}$$

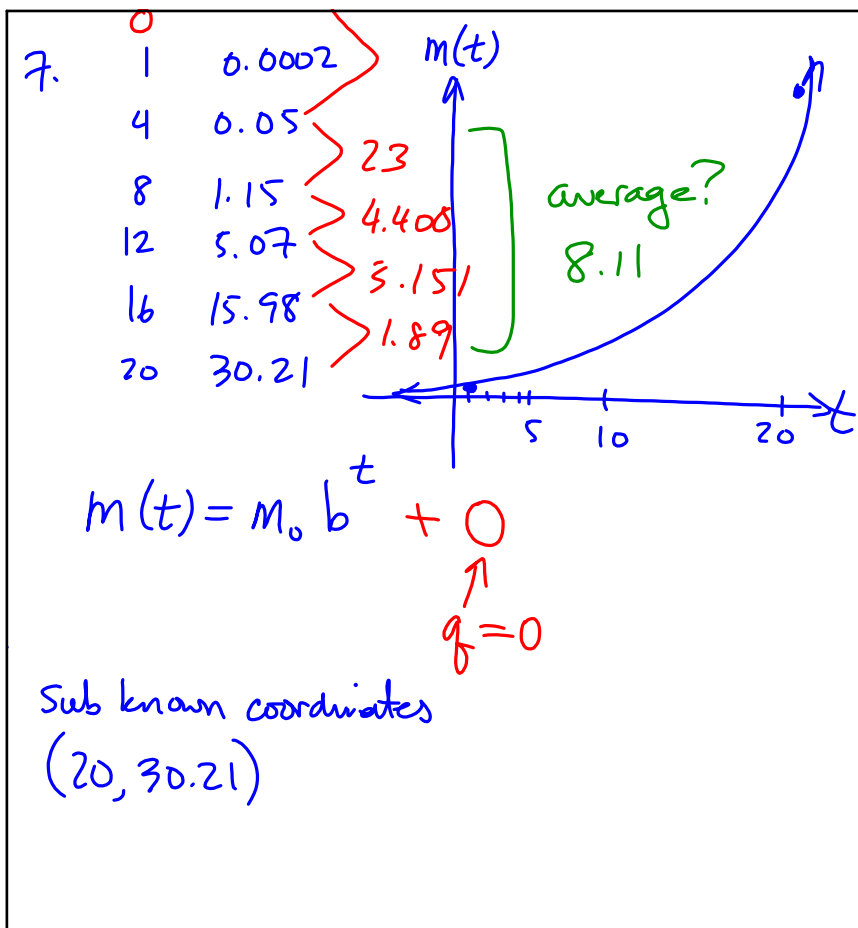
set  $t=10$        $t+h = 10+0.01$        $t=10$   
 $h=0.01$

$$iRoc = \frac{6000(1.075)^{10.01} - 6000(1.075)^{10}}{0.01}$$

(c)  $A(t) = 6000\left(1 + \frac{0.075}{2}\right)^t$   
 ↑ # of semi-annual periods

iRoc at 10 yrs  
 $\Rightarrow t=20$  (semi-years)  
 $h=0.01$

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