T1 Review

Tuesday, June 09, 2009
7:01 AM

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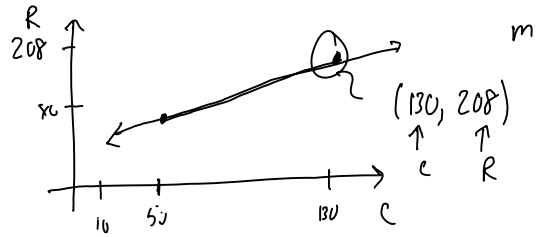
R = retail
C = wholesale cost



$m = \frac{128}{80} = 1.6$ $\frac{\text{dollars retail}}{\text{dollar cost}}$

$R = 1.6C + b$

$208 = 1.6(130) + b$

$208 - 1.6(130) = b$

$b = 0$

$R = 1.6C$

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pg 119/29 $3^{p \log_3 q} = 3^{\log_3 q^p} = q^p$

$\log_3 q^p$ to the $\log_3(q^p)$

$3^{\log_3 x} = x$

$\log_b m^n = n \log_b m$

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pg 121/#106 C-14 dating

$A = A_0 e^{-.000124t}$

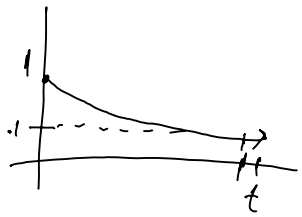
a skull has 10% of A_0, how old is the skull?

what t gives $A = .1A_0$?

$.1A_0 = A_0 e^{-.000124t}$

$\ln(.1) = \ln(e^{-.000124t})$

$\ln(.1) = -.000124t$



$t = \frac{\ln(.1)}{-.00012} = 18569.23$ years

Continuous compounding

$A = Pe^{rt}$

periodic compounding

$A = P\left(1+\frac{r}{n}\right)^{nt}$

Ex. If you want to have \$10,000 in an account 5 years from now. Compounded monthly. Principle \$6,000. What interest rate do you need?

$10000 = 6000\left(1+\frac{r}{12}\right)^{12\cdot 5}$

$5/3 = \left(1+r/12\right)^{60}$

$\ln 5/3 = \ln\left(1+r/12\right)^{60}$

$\ln 5/3 = 60\ln\left(1+r/12\right)$

$\frac{1}{60}\ln 5/3 =$

$\left(\frac{5}{3}\right)^{1/60} = \left(1+\frac{r}{12}\right)$

$\left(\frac{5}{3}\right)^{1/60} - 1 = \frac{r}{12}$

$12\left(\left(\frac{5}{3}\right)^{1/60} - 1\right) = r$

$r = .1026$

10.26% interest

$f(x) = \frac{x^2-4}{x^2+x-6} = \frac{(x-2)(x+2)}{(x+3)(x-2)}$ $\quad x \neq 2, -3$

near $x=2$ $(x \neq 2)$

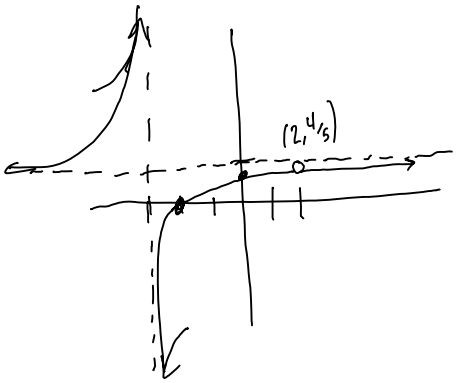
$f(x) = \frac{(x+2)(x-2)}{(x+3)(x-2)} \rightarrow \frac{\text{near } 4}{\text{near } 5}$

as x gets close to 2, $f(x)$ gets close to $4/5$

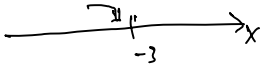
graph has a hole at $(2, 4/5)$

near $x=-3$ $(x \neq -3)$

$$f(x) = \frac{\cancel{(x-2)}(x+2)}{(x+3)\cancel{(x-2)}}$$

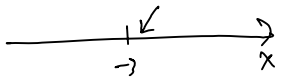


to the left of $x=-3$:



$$f(x) \to \frac{x+2}{x+3} \to \frac{\text{near } -1}{\text{small } -} = \text{Large } +$$

to the right of $x=-3$



$$f(x) = \frac{x+2}{x+3} \to \frac{\text{near } -1}{\text{small } +} \to \text{Large } -$$

H.A. x large

$f \to \frac{\text{large}}{\text{large}}$ rescale! (divide by x^2)

$$f(x) = \frac{x^2/x^2 - 4/x^2}{x^2/x^2 + x/x^2 - 6/x^2} \to \frac{1 - \text{small}}{1 + \text{small} - \text{small}} \to 1$$

$y=1$ is H.A.

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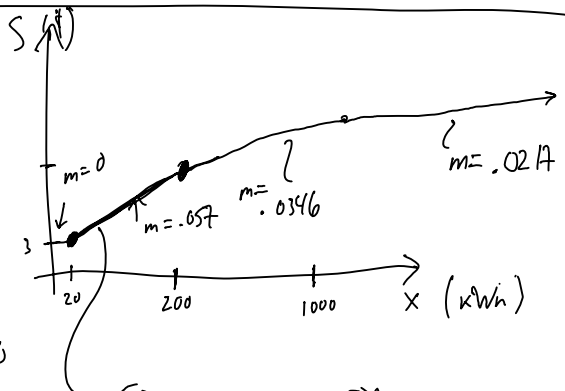

$$S(x) = \begin{cases} 3 & \text{if } 0 \le x \le 20 \\ 3 + .057(x-20), & \text{if } 20 < x \le 200 \\ 13.26 + .0346(x-200), & \text{if } 200 < x \le 1000 \\ \_\_\_ + .0217(x-1000), & \text{if } x > 1000 \end{cases}$$

$S(x) = (\$3) + .057(x - 20)$

$y - 3 = m(x - 20)$

$$\frac{5(2x^2y)^{-2}}{(x^{-2}y^3)^{-3}} = \frac{5\,2^{-2}(x^2)^{-2}y^{-2}}{(x^{-2})^{-3}(y^3)^{-3}} = \frac{5 \cdot 2^{-2}x^{-4}y^{-2}}{x^6 y^{-9}} = 5 \cdot 2^{-2}x^{-4}y^{-2}x^{-6}y^9$$

$$= \frac{5}{2^2} \cdot x^{-10}y^7 = \frac{5}{4} \cdot \frac{y^7}{x^{10}} = \frac{5y^7}{4x^{10}}$$

rationalize

$$\frac{\left(\sqrt{x+h}-\sqrt{x}\right)}{h}\cdot\frac{\left(\sqrt{x+h}+\sqrt{x}\right)}{\left(\sqrt{x+h}+\sqrt{x}\right)} = \frac{\sqrt{x+h}\sqrt{x+h}-\sqrt{x}\sqrt{x+h}+\sqrt{x}\sqrt{x+h}-\sqrt{x}\sqrt{x}}{h\left(\sqrt{x+h}+\sqrt{x}\right)}$$

$$= \frac{(x+h)^2-x^2}{h\left(\sqrt{x+h}+\sqrt{x}\right)}$$