APPLICATIONS OF LOGARITHMS

Great grandpa Sedley left a box buried in your backyard containing $25,000. If you invest it at 4% compounded monthly, will you be a millionaire in your lifetime?

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

$$\frac{1{,}000{,}000}{25000} = \frac{25000\left(1 + \frac{0.04}{12}\right)^{12t}}{25{,}000}$$

$$40 = (1.0033)^{12t}$$

$$\frac{\log(40)}{12\log(1.0033)} = \frac{12t \cdot \log(1.0033)}{12\log(1.0033)}$$

$$93.3 \text{ yrs.} = t$$

CAR - $19,500 15% depreciation
Trade it in when value of $10,000.
How many years will you drive the car?

$$N = N_0 (1 - r)^t$$

$$\frac{10{,}000}{19{,}500} = \frac{19{,}500\,(1 - 0.15)^t}{19{,}500}$$

$$\frac{20}{39} = (0.85)^t \quad \leftarrow \text{log \& plog!}$$

$$\frac{\log\left(\frac{20}{39}\right)}{\log(0.85)} = \frac{t \cdot \log(0.85)}{\log(0.85)}$$

$$4.1 \text{ yrs} = t$$

Carbon-14, a radioactive isotope, is used to find the age of fossils. A piece of parchment from an ancient scroll is found to have 62.5% of its Carbon-14 left. How old is the scroll? The constant of decay of Carbon-14 is -0.000121.

$$q = q_0 e^{kt}$$

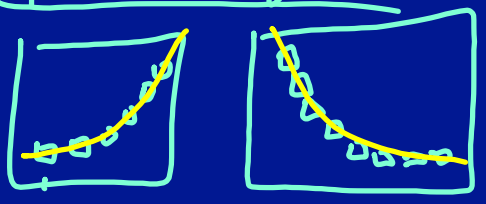
$$0.625 = 1\, e^{-0.000121t}$$

$$\ln 0.625 = \ln e^{-0.000121t}$$

$$\frac{\ln(0.625)}{-0.000121} = \frac{-0.000121\,t}{-0.000121}$$

$$3884_{yrs.} = t$$

Exponential Regression

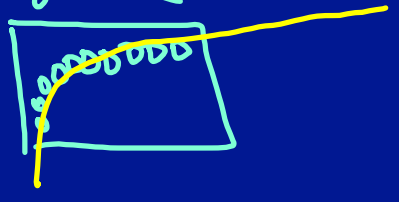


Power Regression

$y = a x^{b}$

Logarithmic Regression

~~Logistic~~



distance	years	Know x.
30.093		← Use Table Ctrl-T
	84.068	

1) Graph $f_1 =$ ~~~~

$f_2 = 89.068$

Intersect