9-15-05

- Selecting Data
  - both columns
- Insert (menu)
  Chart
  - Select XY Scatterplot
  - Add Titles to Series
  - Delete gray background

Pop of Chile 1940-1990 (PSO)

yr	Pop	doubled	
1940	5000	→ 10,000	~ 1975
1950	6000	→ 12,000	~ 1985
1955	7000	→ 14,000	~ 1990

Doubling Time ≈ 35 yrs.

$a = 2^{1/35} = 1.020$ ($r = .02 = 2\%$)

Formula $y = k \cdot a^t$

~~$= 1.02$~~

$$y = 5000 \cdot 1.02^t$$

y: Pop Chile (thous) t: yrs since 1940

Using log graph to check for exponentials

t	y	log(y)
:	:	:
:	:	:
:	:	:

↑ Chart these two ↗

Select all data, plot it

Toss out y-column

Select y-series & remove.

A graph is exponential ⟺ log-graph is linear.

Using Excel to (find) make an exponential regression formula.

① Plot data in Chart

② Click on one data point

③ Chart Menu - Choose Add a Trendline

④ · Click on Exponential Model
- Options Tab
  - Display Formula
  - Display R-squared.

R^2 = % of variation in model y explained by exponential

Formula $y = \underbrace{2E-13}_{K}\left(e^{\underbrace{0.0194}_{a}x}\right)$

ex y = Pop of Chile

x = yr $\quad 0 \leftrightarrow 0$

$$a = e^{0.0194} = 1.019589$$

$$r = a - 1 \approx .0196$$

$$= 1.96\%$$

in Excel = exp(0.0194)

$K = 2E-13 = .000000000000002$

replace yrs by yrs since 1940

$K = 4922.9$

$$y = 4922.9 \times 1.0196^{t}$$

$y = 4922.9 * 1.0196^t$ (5)

	yr	Pop	Predictions
1940 ↔	0	5023	$4922.9 * 1.0196^0 = 4922.9$
	12	5932	$4922.9 * 1.0196^{12} = 6214.10$
	20	7374	$4922.9 \times 1.0196^{20} = 7258.0$
	52	13348	$\cdots \times 1.0196^{52} = 13,507.4$
2005	65		$\cdots \times 1.0196^{65}$ 17,384
2003	63	15665*	16722

yahoo.