

9-21-05

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Hurricane News

Phone #'s 825-0000

888 234-4887

Decision on closing / stay

Late Weds ^{open}

Test I on Fri, Sept 30

Practice Test on Calendar Page

Lab C

Pop of South Africa

Food Prod in South Africa

- Both Changing over time

? How do they compare?

Food Per Capita

Food / Pop

Thomas Malthus (1766 - 1834)

Pessimist. Theories based
on Data.

Geometric Growth of
Population = Exponential
Growth - 25 yrs D.T.

$$\begin{aligned} \text{Rule of 70: } \% \text{ growth} &= \frac{70}{25} \\ &= 2.8\% \end{aligned}$$

The ~~idea~~ true rate
of growth of people in
an "ideal state"

Food Production

Doubles in 1st 25 yrs

| Not Doubled again in next 25 yrs
| Instead Same increase as before.

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Adding same amount each
time

Malthus "Arithmetic Growth"

Modern "Linear"

Put Pop / Food together

t	Pop	Food	Food/Person	# People unprovided for
0	7	7	$7/7 = 1$	0
25	14	14	$14/14 = 1$	0
50	28	21	$21/28 = .75$	$7 = 28 - 21$
75	56	28	$28/56 = .5$	28

Check the Data

What really happened?

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US Pop

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yr	Pop (thou)	% increase
1790 ↔ 0	3929	
10	5308	3.05
20	7240	3.15 %
⋮		
70		
80		

Supports
Malthus'
Theory
of

Geometric
Growth

Can be explained
by US Civil War of Pop

↗ 2.39%

Food
yr

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	Prod	slope
1839	85	$15/10 = 1.5$
10 < 1849	100	
7/10 < 1859	173	$73/10 = 7.3$
69	288	10.5
79	459	17.1
89	468	.9
99	659	19.9

Evidence
against
Malthus'

Theory
of Arithmetic
Growth of
Food Prod.

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Starvation per Malthus' Prediction?

No Wheat production

4.98 Bu/per in 1839

to 8.67 1899

$$y = 7 \cdot 1.05^t$$

Solve for t if $y = 10$

$$\frac{10}{7} = \frac{7}{7} \cdot 1.05^t$$

Knock t down w/ log

$$\log(10/7) = t \log(1.05)$$

$$\frac{\log(10/7)}{\log(1.05)} = t$$