Precalc 11.7

Quiz 11.5-11.6

Find doubling time of exponential relationships
Model data using exponential and logarithmic relationships
(skip linearizing data for now)

lin reg $y = mx + B$ $r =$ $r^2 =$

nonlinear regression

exp } eqt. $r^2 =$
ln }

exponential

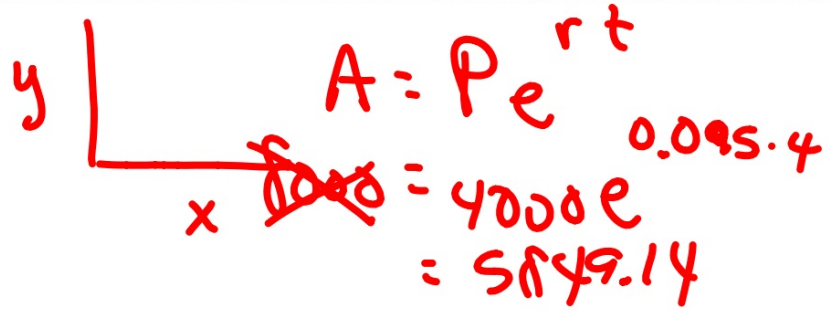
logarithmic

correlation coefficient (r)

coefficient of determination (r^2)



INVESTMENT Latrell, a freshman at Finneytown High School, is given a gift of $4000 by his great aunt. He would like to invest the money so that he will have enough to purchase a car that costs twice that amount, or $8000, when he graduates in four years. If he invests the $4000 in an account that pays 9.5% compounded continuously, will he have enough money to buy the car? *This problem will be solved in Example 1.*



b. What interest rate is required for an investment with continuously compounded interest to double in 4 years?

$8000 = 4000e^{4r}$

$\ln 2 = \ln e^{4r}$

$0.6931 = 4r(1)$

$0.173 = r$

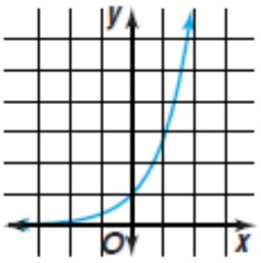
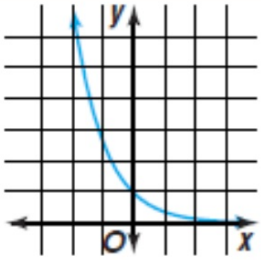
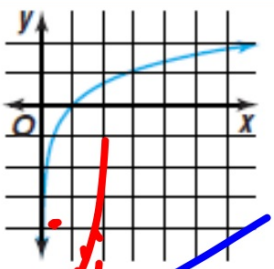
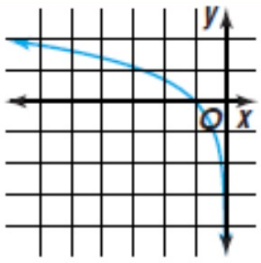
$17.3\% = r$

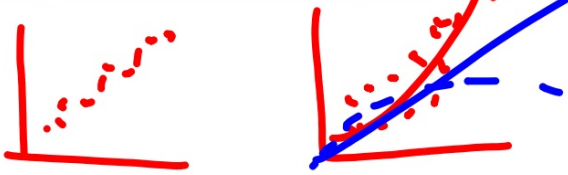
$1{,}000{,}000 = Pe^{0.08 \cdot 65}$

$1{,}000{,}000 = P \cdot e^{5.2}$

$= 181.27 \cdot P$

5516.56

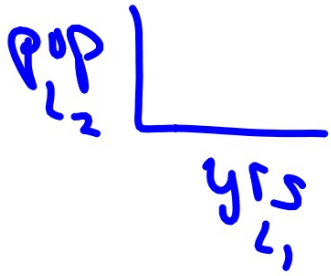
Exponential Functions: $y = ab^x$		Logarithmic Functions: $y = a + b \ln x$	
Growth	Decay	Growth	Decay
			



2 POPULATION The table below gives the population of the world in billions for selected years during the 1900s.

Year	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000
Years since 1900	0	10	20	30	40	50	60	70	80	90	100
Population	1.65	1.75	1.86	2.07	2.30	2.52	3.02	3.70	4.44	5.27	6.06

Source: United Nations



Correlation coefficient...r
Coefficient of determination...r^2
How do we find them?

b. Use the equation to predict the population of the world in 2050.

3 **SKATING** An ice skater begins to coast with an initial velocity of 4 meters per second. The table below gives the times required for the skater to slow down to various velocities. Find an equation that models the data.

velocity (m/s)	3.5	3	2.5	2	1.5	1	0.5
time (s)	2.40	5.18	8.46	12.48	17.66	24.95	37.43

4 **ECONOMICS** **The Consumer Price Index (CPI) measures inflation. It is based on the average prices of goods and services in the United States, with the average for the years 1982–1984 set at an index of 100. The table below gives some CPI values from 1950 to 1996.**

Year	1950	1960	1970	1980	1990	1996
CPI	24.1	29.6	38.8	82.4	130.7	156.9

Source: Bureau of Labor Statistics

d. Use the exponential model to predict the CPI in 2020.