

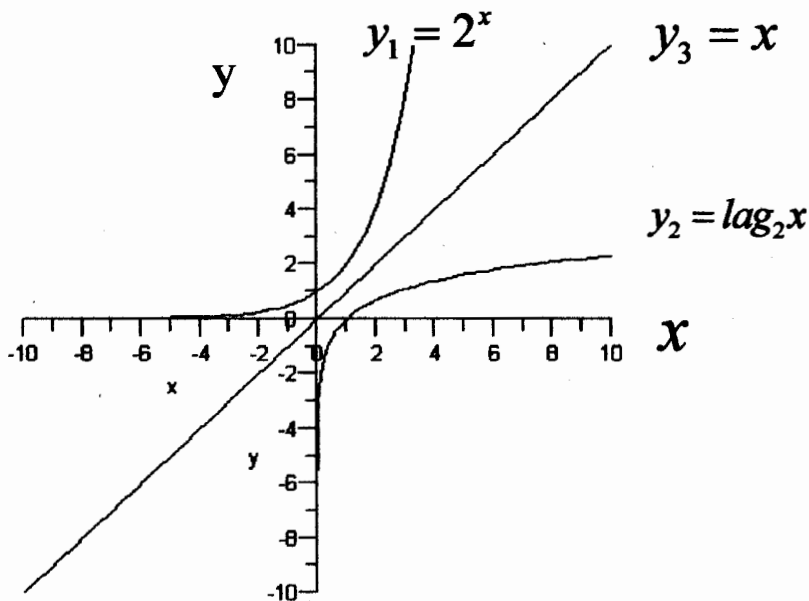
Name: _____

Section: _____

Instructor: _____

Free response (10 points)

- a. If $x = b^y$ with $b > 0$ and $b \neq 1$, then $y = \log_b x$
- b. If $f(x) = b^x$ represents an increasing function, then $b > 1$
- c. In interval notation, the domain of the exponential function $f(x) = b^x$ is $(-\infty, \infty)$
- d. The range of the exponential function $f(x) = b^x$ is: $(0, \infty)$
- e. On the same x-y axis graph: $y_1 = 2^x$, $y_2 = \log_2 x$, $y_3 = x$



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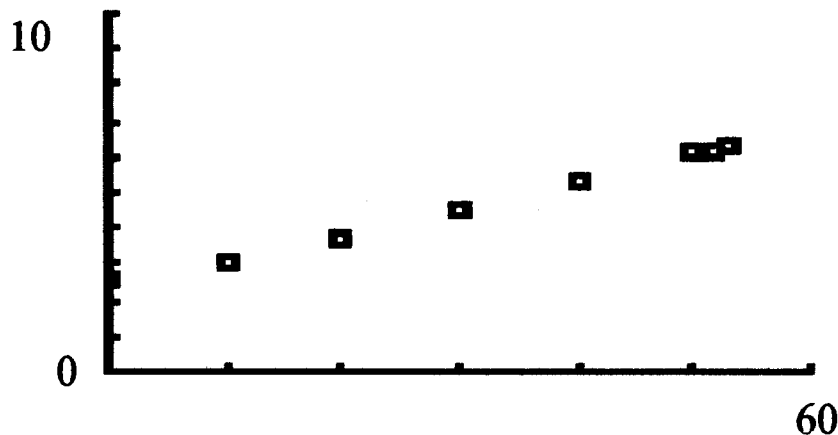
Free response (10 points)

The following table gives the world population over several years. Note that the word population is given in billions.

Year	1950	1960	1970	1980	1990	2000	2002	2003
World Population	2.55	3.034	3.707	4.452	5.281	6.079	6.153	6.229

Let $x = 0$ be the year 1950 and $y = 1$ be one billion

a. Sketch a graph of this data.



- b. Find the best regression formula for the given data. $y = 2.598(1.017)^x$
- c. Justify your answer to b: The correlation coefficient is $r = .9978$
- d. What does the regression estimate the population was in 1965? (show your work)
- 3.350657 Billions**
- e. What does the regression predict the population will be in 2015? (show your work)
- 7.8289414 Billions**