

**Beverly Hills High School -- IAT -- Spring '16 -- Quest #1 -- 80 points**

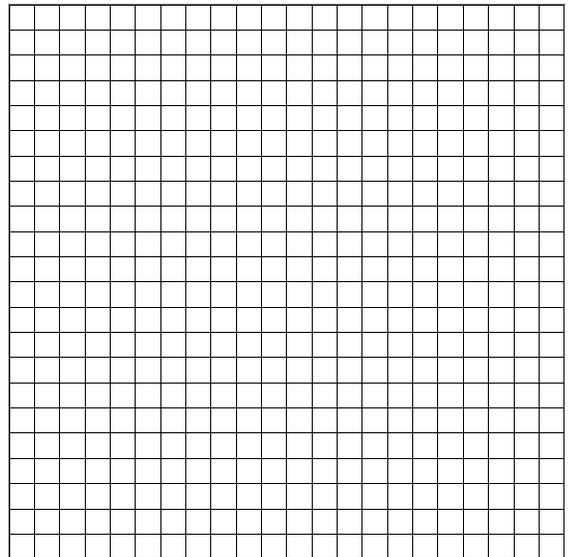
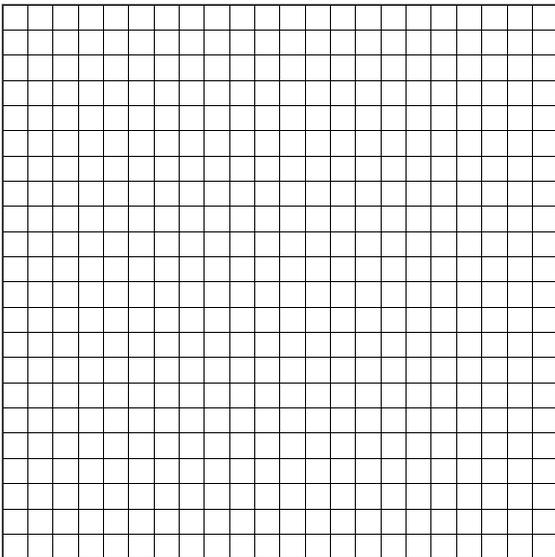
On this and all following exams, give neat and complete answers, those that clearly show your understanding of the problem and its solution. In other words, show all your work. All problems are five points each unless specified otherwise. PENCILS ONLY. Non-graphing calculators only.

- 1) You deposited \$3000 in a savings account paying 4.5% compounded annually. How much will be in your account after 5 years?
- 2) Your 2004 Chevrolet Corvette that dad paid \$54,200 for new has decreased in value 9% each year since then. What is it worth in 2016, twelve years later?
- 3) The half-life of radiocarbon, C-14, is 5730 years. How much of a 120 gram sample would be left after 18,000 years?
- 4) Cancer cells multiply at an alarming rate. If their population increases by 17% each hour, 2000 cancer cells will become how many after one full day?

Sketch the graph of the following exponential functions carefully, as neatly as you can. Complete a table with five inputs and outputs for each. Write in your own axes. Label everything you need to label. 6 points.

5)  $y = 3^{-2x}$

6)  $y = e^{x+2} - 1$



7) What is the domain and range for the function:  $y = 5^{x-7}$

8) What is the domain and range for the function:  $y = 3 + \log_5 x$

9) Comparing  $y = \ln x$  to  $y = \ln(x - 15) + 12$ , describe how the second graph would be shifted: \_\_\_\_\_

---

10)  $\log_7(7^x) =$  \_\_\_\_\_

11) If  $n$  goes to infinity, then the value of  $[(1 + \frac{1}{n})^n]^2$  goes to what? \_\_\_\_\_

12) Rewrite  $a = b^4$  as a logarithmic expression.

13) Rewrite  $\log_5 t = 3$  as an exponential.

Sketch the graph of the following logarithmic functions carefully, as neatly as you can. Complete a table with five inputs and outputs for each. Write in your own axes as appropriate for each graph. Label everything that needs it. Six points.

14)  $y = \ln(x + 1)$

15)  $y = 2 - 5 \log x$

