

Math 131 **NEATLY PRINT NAME:** _____

Exam 1 Items **STUDENT ID:** _____

Fall 2007 **DATE:** _____

Scarborough **EMAIL:** _____

SECTION: 502 (10:20am) 503 (11:30am) 506 (4:10pm)

"On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work."

Signature of student

Academic Integrity Task Force, 2004

<http://www.tamu.edu/aggiehonor/FinalTaskForceReport.pdf>

My signature in this blank allows my instructor to pass back my graded exam in class or allows me to pick up my graded exam in class on the day the exams are returned. If I do not sign the blank or if I am absent from class on the day the exams are returned, I know I must show my Texas A&M student id during my instructor's office hours to pick up my exam.

Signature of student _____

MUTIPLE-CHOICE: There is no partial credit on the multiple-choice questions. You must circle the correct answer(s) on each to receive credit on the multiple-choice questions.

Work Out: Write all solutions in the space provided as full credit will not be given without complete, correct accompanying work, even if the final answer is correct. State any special features or programs you use on your calculator. Put your final answer in the blank provided. Remember your units! Where needed, use complete sentences.

You must clear your calculator. MEM (2nd +), Reset, ALL, Reset

If the return is $f(x) = 1.17x + 1.51$ percent where x is the risk measured in beta, and if the *dj* industrial average is $d(f) = 0.0065f - 90.8182$ dollars where f is the percent return, what is the *dj* industrial average y in dollars in terms of the risk?

- a. $y = 0.007605x - 104.747294$
- b. none of these
- c. $y = 1.1765x - 89.3082$
- d. $y = 0.007605x - 90.808385$
- e. $y = \frac{1.17x + 151}{0.0065x - 90.8182}$

In 2000, the Agglet population had reached 6.78 million. The Agglet population is still increasing by 0.43 million per year. What is the rate of change of the Agglet population?

The amount of an investment of P dollars with interest compounded continuously is modeled by the equation $A(t) = Pe^{0.075t}$ dollars t years after the initial investment. To two decimal places, how many years would it take this investment to double?

- a. 7.74 years
- b. 9.24 years
- c. none of these
- d. 1.86 years
- e. 7.50 years

If $f(t)$ is the average person's consumption of water in liters based upon the temperature t in degrees F during an Aggie football game, interpret

$\frac{df}{dt}$ when $t = 114$.

For the next three problems: The table shows the number of wild horses in a wilderness area in certain years.

Year	1890	1895	1900	1902	1903
Horses	900	1645	3000	3820	4300

There are two models that we should consider for this data. Besides exponential, what other model should we consider? Circle one.

- a. Logistic
- b. None of these
- c. Linear
- d. Quadratic
- e. Logarithmic

If we use an exponential model, what is the percentage change to two decimal places?

- a. 12.79%
- b. 900.50%
- c. 1.13%
- d. 0.13%
- e. none of these

Use the exponential model to estimate the number of wild horses, to the nearest horse, in the wilderness area in 1898.

- a. 2091
- b. none of these
- c. 2660
- d. 2381
- e. 2358

Show your work when calculating the following.

$$\lim_{x \rightarrow -5} \frac{x^2 - 25}{x + 5} =$$

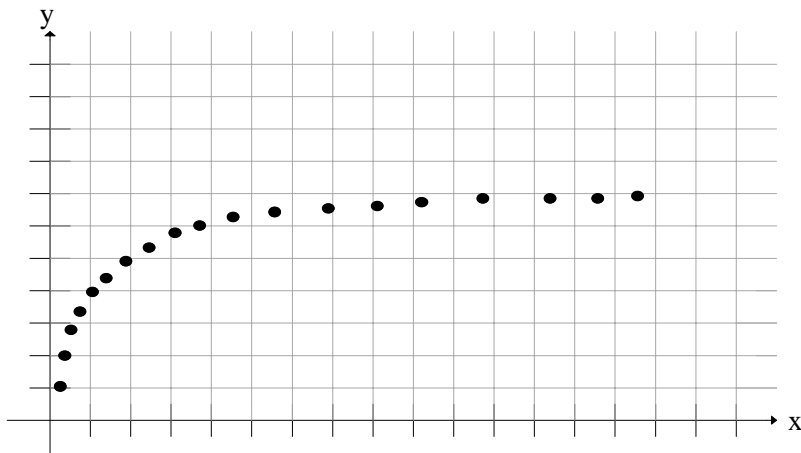
The number of grams of dye per pound of chemical used to treat seed is $g(t) = 1.2t^2 + 0.36t + 6.15$ where t is the t^{th} hour of production, $1 \leq t \leq 8$.

The number of 20-pound batches of chemical produced is $p(t) = 1240(0.95^t)$ where t is the t^{th} hour, $1 \leq t \leq 8$. Which of the following function combinations needs to be performed to find the equation for the model of the hourly number of grams of dye needed.

- $g(p(t))$
- $\frac{g(t)}{20p(t)}$
- $g(t)[20p(t)]$
- $p(g(t))$
- $g(t) \cdot p(t)$
- $g(t) + 20p(t)$

What model should we consider using for the given scatter plot? Circle one.

- logistic
- cubic
- linear
- quadratic
- logarithmic



The amount \$24503.57 is invested at 8.42% APR compounded weekly (there are 52 weeks in a year). What is the APY to two decimal places for this investment?

For the next two problems: A retro virus has attacked 310 people in a city. The table shows the number of infected people with respect to time t days.

t days	0	4	8	12	16	20	26	32	38	40
$n(t)$ infected	310	455	598	808	1076	1250	1382	1452	1484	1492

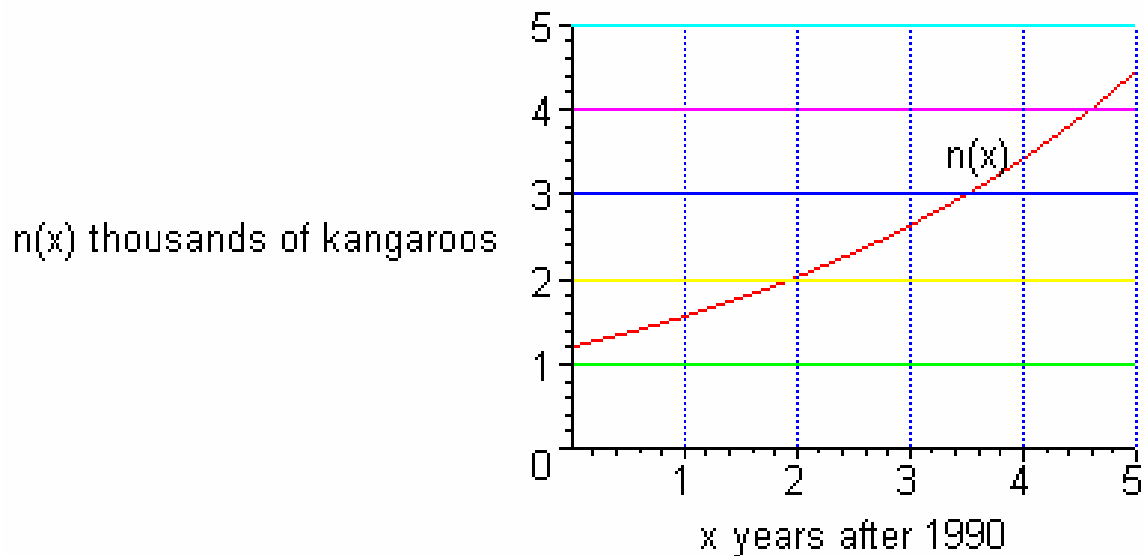
Find the best model for the data.

Which of the following limits would be best to use to estimate the total number of people that will be infected by the virus. Circle one.

- a. $\lim_{t \rightarrow \infty} n(t) = 4.45$
- b. $\lim_{t \rightarrow \infty} n(t) = 1520$
- c. none of these
- d. $\lim_{t \rightarrow \infty} n(t) = 760$
- e. $\lim_{t \rightarrow \infty} n(t) = 10$

If $f(x) = x^2 - 2x + 5$, use the derivative formula (no shortcuts) to calculate $f'(x)$.

The graph of thousands of kangaroos $n(x)$ in zoos for x years after 1990 for $0 \leq x \leq 5$ is shown. Use the graph to estimate the percentage rate of change, to 2 decimal places, at $x = 3$.



The amount \$38685.00 is invested at 7.9% APR compounded monthly. What is the APY to two decimal places for this investment?

If $f(x) = x^2 - 3x + 6$, use the derivative formula (no shortcuts) to calculate $f'(x)$.

Show your work when calculating the following.

$$\lim_{x \rightarrow -7} \frac{x^2 - 49}{x + 7} =$$