MATH 1311

Test 3 Review

Bacteria in a petri dish have an initial number of 45 colonies and are multiplying from there. Sketch a possible graph of their population growth.

Bacteria in a petri dish have an initial number of 45 colonies and are multiplying from there. Sketch a possible graph of their population growth.

If the population will double in 5 hours, determine the formula for hourly population growth.

The number of trees in a forest is declining by 7% every year. The current population of the forest is 3575 trees.

Write an exponential function to model this situation.

The number of trees in a forest is declining by 7% every year. The current population of the forest is 3575 trees.

Determine the population of the forest in 6 years.

The number of trees in a forest is declining by 7% every year. The current population of the forest is 3575 trees.

Determine when the population will reach 1500 trees.

The formula for the weight of a toddler is given by: $w(t) = 35(1.15)^x$ where t is measured in months.

What is the monthly growth rate of the child? (give as a percent increase or percent decrease)

The high temperature in the month of December decreases by 2% every day. By what percent of the original will it decrease by the 20th of the month?

Identify the following tables of values as linear, exponential or neither. Find an equation if linear or exponential.

x	y
0	12
1	20
2	35
3	59
4	100
5	170

x	y
0	214
1	210
2	206
3	202
4	198
5	194

x	y
0	23
1	34
2	47
3	62
4	79
5	98

The following table shows the number of alligators in a nature preserve.

Year	2005	2006	2007	2008	2009
Alligators	21	73	214	619	1855

Rescale the table so that x = 0 corresponds to 2005 and find the exponential regression of the table.

The following table shows the number of alligators in a nature preserve.

Year	2005	2006	2007	2008	2009
Alligators	21	73	214	619	1855

What year will the population reach 2000 alligators?

The Richter scale is used for comparing the magnitudes of earthquakes. An increase of t on the Richter scale means an increase of 10^t in the magnitude of the earthquake.

Two earthquakes register a 3.5 and a 6.1 on the Richter scale. Compare their magnitudes.

How does the volume of a cube change if its edge decreases by 12%.

Formulas to know:

Volume of a cube: $V = e^3$

Volume of a sphere: $V = \frac{4}{3}\pi r^3$

Area of a rectangle: $A = L\,W$

Area of a triangle: $A = \frac{1}{2}B\,H$

Given the following logistic growth model:

$$N(t) = \frac{250}{1 + be^{-0.255t}}$$

If the initial value is N(0) = 40, determine the value of b.

What is the carrying capacity of the function?

Determine the coordinates of the point of inflection of the function.

Determine the composite function f(g(x)) if:

f(x) = 2x + 8   and   g(x) = e^x

Use this to determine the value of f(g(2)).

A certain quantity increases by 12% every day.
What is the daily growth factor?
What is the weekly growth factor?
What is the monthly (30 day) growth factor?