MTH 150 Chapter 4

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1 Reflection

When it came to this chapter i had to refresh my memory on logarithm functions and properties for this section i relied heavy on my graphing calculator for help.

I had a little bit of trouble in section 4.1 and 4.2 at first because i had forgotten most rules for logs. Once i looked back at the expressions i was able to complete this section quite easily

I found section 4.3 really easy as all i had to do was use the expression $b^a = c$ rewrite all the logarithm equations

As for section 4.4 i found it o be most difficult as knowing the differences in the logs was a bit complicated for me. I had to refer back to the answer solution to double check my work.Im still a bit unsure of how the use the expressions

In section 4.5 i found it to be pretty easy since i used my calculator to graph the log functions to figure out its domain and vertical asymtope

2 Section 4.1 Exponential Functions

2.1 7,13,23

1. A population numbers 11,000 organisms initially and grows by 8.5 percent each year. Write an exponential model for the population.

$$F(x) = ab^x$$
$$b = (1 + r)$$
$$b = 1.085$$
$$f(x) = 11,000(1.085)^x$$

.Find a formula for an exponential function passing through the two points.(0,6), (3,750)

$$(0, 6), (3, 750)$$
$$f(x) = ab^x$$
$$f(0) = ab^0$$
$$f(0) = 6$$
$$a = 6$$
$$f(x) = 6b^x$$
$$plugin750$$
$$750 = 6(b)^3 = b = 5$$
$$f(x) = 6(5)^x$$

23 **D**escribe the long run behavior, as x → and x → of each function

$$f(x) = -5(4^x) - 1$$

$As x approaches \infty f(x) approaches - \infty$
$As (x) approaches \infty f(x) approaches - \infty$

$$4^x is multiplied by a negative$$

Comments

This was pretty simple, after having a refresher on the subject this section i found to be very easy.

3 Section 4.2 Graphs of Exponential Functions

3.1 11,23

11 *Sketch a graph of each of the following transformations of f (x)= 2*^{x} $f(x) = 2^x$

23 *A radioactive substance decays exponentially. A scientist begins with 100 milligrams of a radioactive substance. After 35 hours, 50 mg of the substance remains. How many milligrams will remain after 54 hours?*

$$f(x) = a(b)^x$$

$$a = 100$$

$$100(50)^x$$

$$f(x) = 100(0.98031)^x$$

$$f(x) = 100(0.98031)^5 4$$

$$f(x) = 33.58 milligrams$$

Comments

This was pretty simple, i had trouble though figuring out the word problems as figuring out the inputs were difficult to find.

4 Section 4.3 Logarithmic Functions

4.1 1, 9, 17, 41 ,65

1 *Rewrite each equation in exponential form*

$$log4(q) = m$$

$$logb(C) = a$$

$$b^a = c$$

$$4^m = q$$

9 *Rewrite each equation in logarithmic form.*

$$4^x = y$$

$$b^a = c$$

$$logbC = q$$

$$log4 = 7 = x$$

17 *Solve for x.*

$$log3(x = 2)$$

$$b^a = c$$

$$3^2 = x$$

$$x = 9$$

41

$$b^a = C$$

$$5^x = 14$$

$$log5^1 14 = x$$

$$x = 1.639$$

65 *The population of Kenya was 39.8 million in 2009 and has been growing by about 2.6 percent each year. If this trend continues, when will the population exceed 45 million?*

$$y = ab^t$$

$$b = (1 + r)$$

$$2.6 = 1.026b$$

$$f(t) = 4.5million$$

$$\frac{45 = (39.8)(1.026)^t}{39.8}$$

$$4.78years$$

Comments

This was pretty simple, had to be careful when i inputting the right variables

5 Section 4.5 Graphs of Logarithmic Functions

5.1 1,2,3,4

1

$$f(x) = log(x - 5)$$

Domain = x ¿ 5
(VA) = x=5

2

$$ln(3 - x)$$

Domain = x¡ 3
(VA) = x=3

3

$$log(3x + 1)$$

Domain x ¡

$$\frac{1}{3}$$

(VA) x=

4

$$3log(-x) + 2$$

Domain = x ¡ 0
(VA) = x = 0
This was fairly simple, got a little lost when trying to find the asymtope points as its been a while but the work was easy