Mth 133

MTH133

Unit 4 – Individual Project – A

**Name:**

1) State the domain of the following and provide a brief explanation for your answer:

a) 

Answer:

b) 

Answer:

c) 

Answer:

d) 

Answer:

e) 

Answer:

2) Suppose the graph of is shifted to obtain each the following graphs. What is the equation of the function, *g*(*x*), for each graph? Write your answers in terms of x2 and/or x.

a)



Answer:

b)



Answer:

3) Consider the following graph of *y* = *f*(*x*).



P

a) If *h*(*x*) *= f*(*x*) *+ 2*, what would the new coordinates of *P* be after the shift? Give answer in (*x*, *y*) form.

Answer:

b) If , what would the new coordinates of *P* be after the reflection? Give answer in (*x*, *y*) form.

Answer:

4) Consider the function .

a) Find *h*, the *x*-coordinate of the vertex of this parabola.

Answer:

Show your work here:

b) Substitute the two integers immediately to the left and right of *h* into the function to find the corresponding *y*. Fill in the following table. Make sure your *x*-values are in increasing order in your table.

Answer:

|  |  |
| --- | --- |
| ***X*** | ***y*** |
|  |  |
|  |  |
| ***h* =\_\_** |  |
|  |  |
|  |  |

c) Use MS Excel to graph the function by plotting the points found in the table in part b.

Answer:

5) Find the equations of the horizontal and vertical asymptotes for the following. Type *none* if the function does not have an asymptote.

a) 

Horizontal:

Vertical:

b) 

Horizontal:

Vertical:

c)



Horizontal:

Vertical:

d)



Horizontal:

Vertical:

|  |
| --- |
|  |
|  |
| |  |  | | --- | --- | |  | **Assignment Type:** Discussion Board   **Deliverable Length:** 1 paragraph  Pick a country of your choice that is experiencing population growth. Using the Library, web resources, and/or other materials to find the most recent population count of the country you have chosen and the population growth rate of that country. Use that growth rate to approximate the population in the year 2012. Solve the problem using the method similar to that used to solve number 65 on page 410 of the e-book. Show your detailed, worked out solution for full credit. Write a paragraph about how you might use this information in a role as a politician, government administrator or business owner/operator. What will it mean to the country, its economy, resources or the business? Be sure to reference all sources using APA style. Do not use any part of the sample below in your post; do not use India, China or the United states as your country. Type (1.014)^4 for (1.014) to the fourth power.  Note that this sample would not receive full credit because there is no detailed work shown, nor does it have the discussion asked for in the prompt.  Sample Post: The population of India in 2005 was 1,080,264,388. The growth rate is 1.4%. Note that in this instance, the percent must be converted to its decimal equivalent before it can be used to make computations with the formula.  In 2006, the approximate population is 1,095,388,089. In 2007, approximate population is 1,110,723,523. In 2008, approximate population is 1,126,273,652.  In 2012, approximate population is 1,190,681,880  **In your own words, please post a response to the Discussion Board and comment on other postings. You will be graded on the quality of your postings.**  **Reference**  World factbook: India people. (N.D.). Retrieved April 26, 2007, from [http://education.yahoo.com/reference/factbook/in/popula.html](https://mailbag.aiuonline.edu/exchweb/bin/redir.asp?URL=http://education.yahoo.com/reference/factbook/in/popula.html) | |

Unit 5 Individual Project – A

**Name:**

1) Find the domain of the following:

a) 

Answer:

Explain how you obtained your answer here:

b) 

Answer:

Show your work or explain how you obtained your answer here:

c) 

Answer:

Explain how you obtained your answer here:

d) 

Answer:

Show your work or explain how you obtained your answer here:

2) Describe the transformations on the following graph of. State the placement of the horizontal asymptote and *y*-intercept after the transformation. For example, *horizontal shift to the* *left 1* or *reflected about the y-axis* are descriptions.



a) 

Description of transformation:

Equation(s) for the Horizontal Asymptote(s):

*y*-intercept in (*x, y*) form:

b) 

Description of transformation:

Equation(s) for the Horizontal Asymptote(s):

*y-*intercept in (*x, y*) form:

3) Describe the transformations on the following graph of. State the placement of the vertical asymptote and *x*-intercept after the transformation. For example, *vertical shift up 2* or *reflected about the x-axis* are descriptions.



a) 

Description of transformation:

Equation(s) for the Vertical Asymptote(s):

*x*-intercept in (*x, y*) form:

b) 

Description of transformation:

Equation(s) for the Vertical Asymptote(s):

*x*-intercept in (*x, y*) form:

4) The formula for calculating the amount of money returned for an initial deposit into a bank account or CD (certificate of deposit) is given by  
  
*A* is the amount of the return.  
*P* is the principal amount initially deposited.  
*r* is the annual interest rate (expressed as a decimal).  
*n* is the number of compound periods in one year.  
*t* is the number of years.

Carry all calculations to six decimals on each intermediate step, then round the final answer to the nearest cent.  
  
Suppose you deposit $2,000 for 5 years at a rate of 8%.

a) Calculate the return (*A*) if the bank compounds annually (*n* = 1). Round your answer to the nearest cent.

Answer:

d) If a bank compounds continuously, then the formula used is   
where *e* is a constant and equals approximately 2.7183.  
Calculate *A* with continuous compounding. Round your answer to the nearest cent.

Answer:

Show work in this space:

e) A commonly asked question is, “How long will it take to double my money?” At 8% interest rate and continuous compounding, what is the answer? Round your answer to the hundredth's place.

Answer:

Show work in this space:

5) Suppose that the function  represents the percentage of inbound e-mail in the U.S. that is considered spam, where *x* is the number of years after 2000.

Carry all calculations to six decimals on each intermediate step when necessary.

a) Use this model to determine the percentage of spam in the year 2003. Round your answer to two decimals places.

Answer:

Show your work in this space:

b) Use this model to determine in how many years (to two decimal places) it will take for the percent of spam to reach 95% provided that law enforcement regarding spammers does not change.

Answer:

Show your work in this space:

Show work in this space. Use ^ to indicate the power or use the Equation Editor in MS Word.

b) Calculate the return (*A*) if the bank compounds quarterly (*n* = 4). Round your answer to the nearest cent.

Answer:

Show work in this space:

c) Does compounding annually or quarterly yield more interest? Explain why.

Answer:

Explain:

DISCUSSION BOARD – 2-3 PARAGRAPHS

Part 1: Using the Library, web resources, and/or other materials, find the logarithmic formula that gives the pH of a substance. State what each variable in your equation represents.

Find the pH of a substance of your choice that is alkaline (basic). Using this pH, show how to find the hydrogen ion concentration, [H+], of the substance using the formula. Discuss the meaning of pH and [H+], the pH scale and why your chosen substance is alkaline. Use scientific notation or enough decimal places so that your answer has at least 3 place values. For example, either use 3.44\*10-9 or 0.00000000344.

Part 2: Part 1: Suppose that the number of new homes built, H, in a city over a period of time, t, is graphed on a rectangular coordinate system where time is on the horizontal axis. Suppose that the number of homes built can be modeled by an exponential function, H= p \* at , where p is the number of new homes built in the first year recorded. If you were a homebuilder looking for work, would you prefer that the value of a to be between 0 and 1 or larger than 1? Explain your reasoning. Be sure to reference your sources using APA style.

**In your own words, please post a response to the Discussion Board and comment on other postings. You will be graded on the quality of your postings.**