Performance Assessment Task

Facebook Users

Imagine that you are a reporter in 2010. You have heard predictions that Facebook will have one billion users by the end of the year. Your editor has asked you to examine the information below, and decide whether or not you agree with this prediction. Provide your editor with your own prediction, supported by all relevant graphs and mathematical calculations.

Graph Exponential Function

- The growth of Facebook users between December 2004 and February 2010 was exponential in nature and can be modeled by the function $u = 1.38(1.1)^x$, where u is the number of users in millions, and x is the number of months after December 2004. Graph this function. Provide a reasonable explanation of the domain and range of this function within the context of this problem.

Solve Exponential Equation

- Assuming that the number of Facebook users continues at the same rate of growth, use your graph to predict when the number of users will reach one billion.
- Solve the equation algebraically to verify your prediction.

Fast forward to the present day… Your editor has asked you to do a follow-up article!

Calculate Number of Users

- Determine how many Facebook users there would be today if Facebook had continued to grow at the same rate.

Evaluate Model

- Discuss the reasonableness of this growth model. Is an exponential function the best model for this data?

Rubric: Facebook Users

Student _____ **Date** _____

Level / Criteria	Excellent	Proficient	Adequate	Limited *	Insufficient/ Blank *
Graph exponential function (Relations and Functions 9) [C, CN, T, V]	Draws a suitable graph and provides an **insightful** description of the domain and range.	Draws a suitable graph and provides a **meaningful** description of the domain and range.	Draws a suitable graph and provides a **basic** description of the domain and range.	Graph is **not suitable** to the context and description of domain and range is **questionable**.	No score is awarded because there is insufficient evidence of student performance based on the requirements of the assessment task.
Solve exponential equation (Relations and Functions 7, 8, 10) [C, CN, ME, PS, R, T]	Algebraically manipulates the exponential equation **correctly** determine a solution.	Algebraically manipulates the exponential equation in a **substantially correct** manner to determine a solution.	Algebraically manipulates the exponential equation in a **partially correct** manner to determine a solution.	**Unable** to manipulate the exponential equation to determine a solution.	
Calculate the number of users (Relations and Functions 10) [C, CN, PS, R]	Applies the given function **correctly** to determine the number of users.	Applies the given function in a **substantially correct** manner to determine the number of users.	Applies the given function in a **partially correct** manner to determine the number of users.	**Unable** apply the given function to determine the number of users.	
Evaluate model (Relations and Functions 9) [C, CN, T, R, V]	Provides a **perceptive** discussion of the reasonableness of the growth model.	Provides a **thoughtful** discussion of the reasonableness of the growth model.	Provides a **simplistic** discussion of the reasonableness of the growth model.	Discussion of the reasonableness of the growth model is **questionable**.	

* When work is judged to be limited or insufficient, the teacher makes decisions about appropriate intervention to help the student improve.