

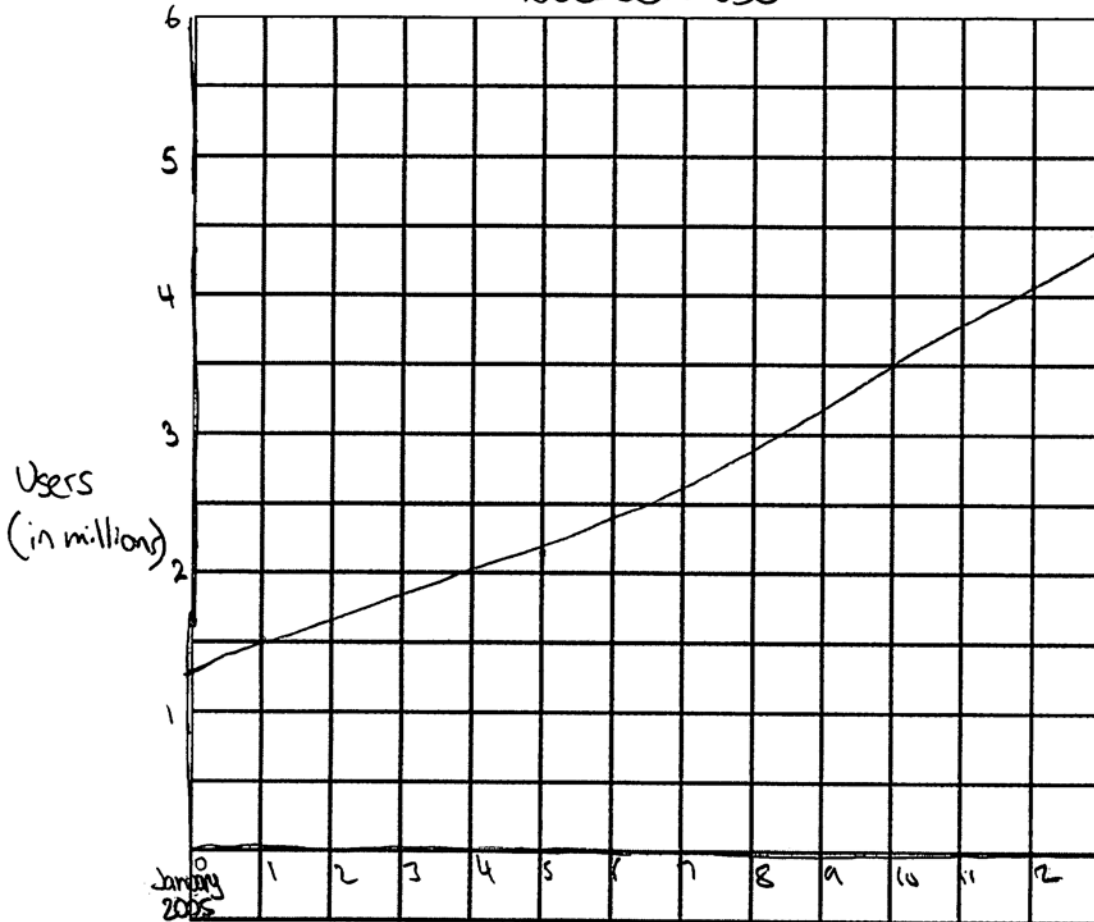
**Mathematics 30-1
Performance Assessment: First Steps**

Facebook Users

Name Sample 2

Graph the function from the student task.

facebook user



Range $\{0 \leq y \leq \text{population that has access to facebook connectivity, } y \in \mathbb{R}\}$

• can't have no users but can't have more people than have access to internet

Domain $\{x, x \in \mathbb{R}\}$

• time is infinite.

Criterion 1 - Excellent

Consider a reasonable domain and range within the context of this situation. Does the graph fit within this domain and range?

Next Steps

- Use the equation to predict what the total number of Facebook users should have been in August of 2012.
- Discuss whether that is a reasonable prediction.
- Use your equation to determine when the population should have hit 1 billion users.

10 Users # in August 2012

92 months

$$U = \frac{1.38(1.1)^{92}}{1.38 - 1.1}$$

Criterion 2, Part 1
Excellent

$$U = \frac{1.38(6428.75736)}{1.38 - 1.1}$$

$$U = 1887168517$$

Criterion 2, Part 2
Proficient

This is not a reasonable prediction because it would be saying that the same amount of people are always joining at the same rate as they did from December 2004 to February 2010. This is just an estimate.

2. $\frac{1.00 - 100000}{1.38} = \frac{1.38(1.1)^x}{1.38}$

$$72469181.2 = 1.1^x$$

$$\frac{\log(72469181.2)}{\log(1.1)} = \frac{x(\log 1.1)}{\log(1.1)}$$

Criterion 3
Proficient

$$x = 189.8 \text{ months from } \dots$$

~ September, 2010

Mathematics 30-1
Performance Assessment: Rubric
Facebook Users

Student _____ Sample 2 _____ Date _____

Level Criteria	4 Excellent	3 Proficient	2 Adequate	1 Limited *	Insufficient/ Blank *
<p>Graph an exponential function (Relations and Functions 9)</p> <p>[C, CN, T, V]</p>	<p>Draws an accurate graph and provides an in-depth description of the domain and range.</p> <p><i>The graph could have broader window settings, but it is accurate for the domain shown. The discussion of the domain and range is in-depth and the student addresses the idea of an upper limit on the range.</i></p>	<p>Draws an accurate graph and provides a sufficient description of the domain and range.</p>	<p>Draws an accurate graph and provides a partial description of the domain and range.</p>	<p>Draws an inaccurate graph and provides a flawed description of the domain and range.</p>	<p>No score is awarded because there is insufficient evidence of student performance based on the requirements of the assessment task.</p>
<p>Calculate the number of users (Relations and Functions 10)</p> <p>[C, CN, PS, R]</p>	<p>Applies the given function correctly to determine the number of users.</p> <p><i>The student has correctly determined the number of months and substituted correctly.</i></p> <p>Provides a perceptive discussion of the reasonableness of the answer.</p>	<p>Applies the given function in a substantially correct manner to determine the number of users.</p> <p>Provides a thoughtful discussion of the reasonableness of the answer.</p> <p><i>The description below the Criterion 2, Part 2 label above is probably only adequate. This student was given proficient here because of the response in criterion 1. At that point, the student considers the number of people with internet to be a limitation. The student should be encouraged to link that response to this discussion of reasonableness.</i></p>	<p>Applies the given function in a partially correct manner to determine the number of users.</p> <p>Provides a simplistic discussion of the reasonableness of the answer.</p>	<p>Unable apply the given function to determine the number of users.</p>	

**Mathematics 30-1
Performance Assessment: Rubric**

Facebook Users

<p style="text-align: center;">Solve exponential equation graphically and algebraically (Relations and Functions 7 and 8)</p> <p>[C, CN, ME, R, T]</p>	<p>Algebraically manipulates the exponential equation correctly to verify the graphical prediction.</p>	<p>Algebraically manipulates the exponential equation in a substantially correct manner to verify the graphical prediction.</p> <p style="color: red;">The equation is solved correctly. It has not been rounded correctly, however. The student has not made a graphical prediction.</p>	<p>Algebraically manipulates the exponential equation in a partially correct manner to verify the graphical prediction.</p>	<p>Unable to manipulate the exponential equation to verify the graphical prediction.</p>
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* When work is judged to be limited or insufficient, the teacher makes decisions about appropriate intervention to help the student improve.