Problem-Based Task 6.2.2: Movie Buzz

Coaching Sample Responses

a. Create a scatter plot of the given data.
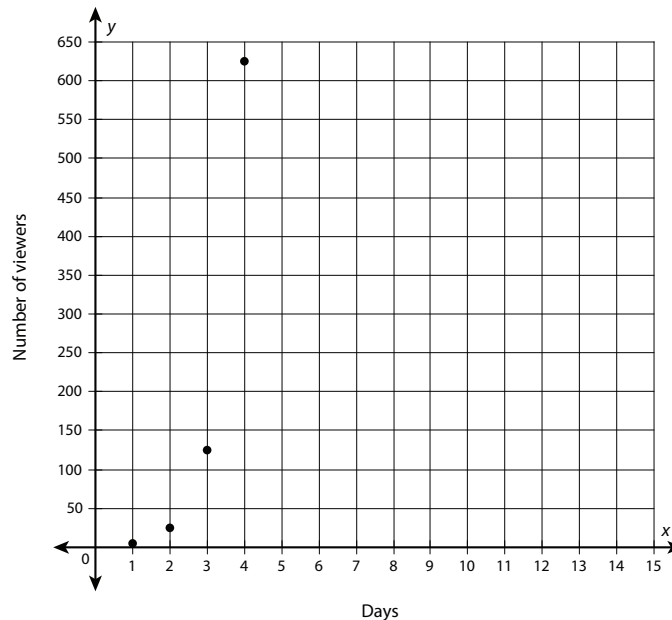
b. Look at the shape of the scatter plot. Is the data linear or exponential?

If the data were linear, the slope between each pair of points would be the same. As the *x*-values increase by 1, the *y*-values increase by different amounts. The change in *y* between the first two points is much less than the change in *y* between the second and third points. The change in *y* between the second and third points is much less than the change in *y* between the third and fourth points. The shape of the scatter plot is curved, and it appears to follow the shape of an exponential curve.

c. Graph the equations $y = 5^x$ and $y = 200x - 200$ on the scatter plot with the data.

To create a graph of the exponential equation $y = 5^x$, evaluate the equation at several values in the domain of the data set; 0 is an easy value with which to start. The original data set contains the values 1, 2, 3, and 4 in the domain; evaluate the equation at these values.
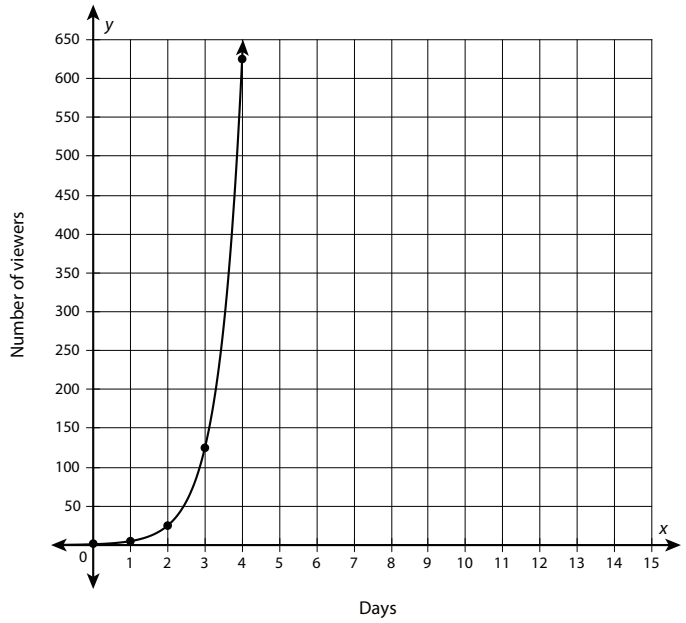
x	$y = 5^x$
0	$5^0 = 1$
1	$5^1 = 5$
2	$5^2 = 25$
3	$5^3 = 125$
4	$5^4 = 625$

Plot each of these values on the scatter plot, and connect the lines with a curve.
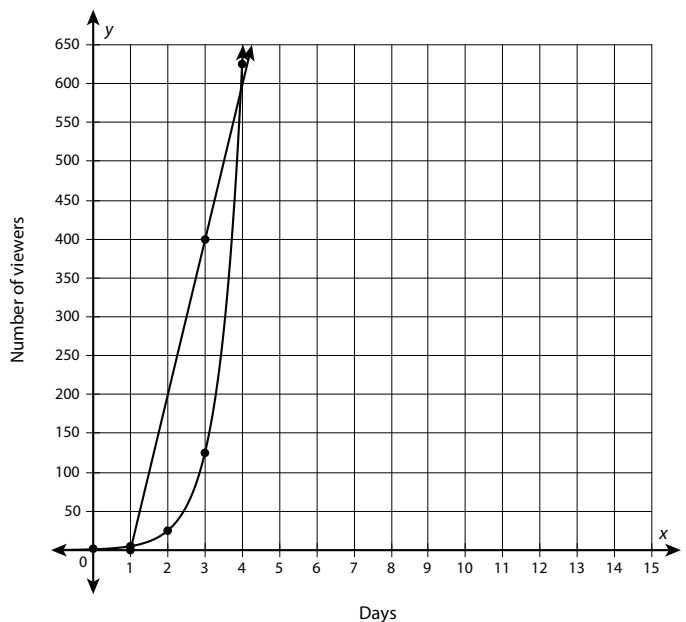

The graph of a linear equation is a line. To plot a linear equation, find at least two points on the line. Two values to evaluate are $x = 1$ and $x = 3$.

$y = 200(1) - 200 = 0$ Substitute 1 for x.

$y = 200(3) - 200 = 400$ Substitute 3 for x.

Plot the points (1, 0) and (3, 400) on the same graph as the scatter plot and draw a straight line through the points.

d. Which equation is a better fit for this data?

Look at the shape of each graph. The first graph of $y = 5^x$ comes very close to the data set, and matches the shape of the data. This equation is a better fit for the data.

e. Use this equation to estimate the number of people who will see the movie on the fifth day.

The *x*-values are the number of days, so replace *x* in the equation $y = 5^x$ with 5. Evaluate the expression to find the value of *y*.

$$y = 5^{(5)} = 3125$$

On the fifth day, there will be approximately 3,125 viewers if this pattern continues.

Recommended Closure Activity

Select one or more of the essential questions for a class discussion or as a journal entry prompt.