

Work Independently

How much do you share on social media? Do you have accounts linked to your computer, phone, and tablet? The average teen spends around five hours per day online, and checks his or her social media account about 10 times each day.

When an image or post is shared publicly, some students are surprised at how quickly their information travels across the Internet. The scary part is that nothing online is really private. All it takes is one friend sharing your photo or updates with the public to create a very public viral trend.

For this project, you will use what you have learned about exponential functions to study what happens if a social media post is shared publicly.

Social Sharing

Three Algebra 1 students are comparing how fast their social media posts have spread. Their results are shown in the following table:

Student	Amber	Ben	Carter								
Description	Amber shared her photo with 3 people. They continued to share it, so the number of shares increases every day, as shown by the function.	Ben shared his post with 2 friends. Each of those friends shares with 3 more every day, so the number of shares triples every day.	Carter shared his post with 10 friends, who each share with only 2 people each day.								
Social Media Post Shares	$f(x) = 3(4)^x$	<table border="1"><thead><tr><th>Day</th><th>Number of Shares</th></tr></thead><tbody><tr><td>0</td><td>2</td></tr><tr><td>1</td><td>6</td></tr><tr><td>2</td><td>18</td></tr></tbody></table>	Day	Number of Shares	0	2	1	6	2	18	Carter shared his post with 10 friends, who each share with only 2 people each day.
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1	6										
2	18										

1. Write an exponential function to represent the spread of Ben's social media post.

2. Write an exponential function to represent the spread of Carter's social media post.

3. Graph each function using at least three points for each curve. All graphs should be placed together on the same coordinate plane, so be sure to label each curve. You may graph your equation by hand on a piece of paper and scan your work, or you may use graphing technology.

4. Using the functions for each student, predict how many shares each student's post will be received on Day 3 and then on Day 10. Justify your answers.

5. If Amber decides to mail copies of her photo to the 45 residents of her grandmother's assisted living facility, the new function representing her photo shares is $f(x) = 3(4)^x + 45$. How does this graph compare with the original graph of Amber's photo share?

6. Based on your results, which students' post travels the fastest? How is this shown in the equation form of the functions?

7. If you had to choose, would you prefer a post with fewer friends initially but more shares, like Amber, or more friends initially but fewer shares? Justify your answer with your calculations from previous questions.

Graphing Exponential Functions—Option 1 Rubric

Requirement	Possible Points	Student Points
Student provides the correct exponential function for Ben's scenario.	2	
Student provides the correct exponential function for Carter's scenario.	2	
Graph is complete and accurate, and all three student graphs are shown and labeled correctly.	6	
All three predictions are correct for Day 3 and Day 10.	4	
Student explains correctly which post travels fastest and provides justification.	2	
Student explains correctly how the new graph compares with the original.	2	
Student provides complete discussion on which option he or she prefers and justifies	2	

his or her answer mathematically.		
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