10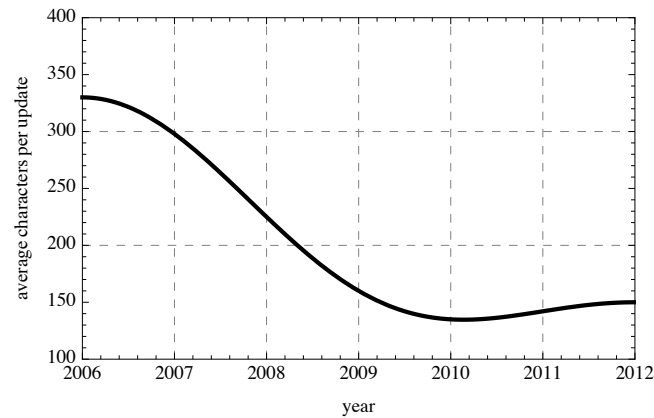. [10 points] Facebook tracks the average number of characters used by its users to write their status updates. Below is the graph for a random (talkative) user from the beginning of 2006 to the beginning of 2012. Use the graph to answer the following questions.

a. [2 points] When were this user's status updates the longest? How long were they?

Solution: From the graph, the status updates are the longest when Facebook began tracking the length of status updates. The status updates are longest at the beginning of 2006 when they were an average of 330 characters.

b. [3 points] When was the length of the user's status updates decreasing? Increasing?

Solution: The status updates are decreasing from the beginning of 2006 until the beginning of 2010. The length of status updates is increasing from the beginning of 2010 to the beginning of 2012.

c. [2 points] When was the length of status updates shrinking the fastest?

Solution: The graph appears to have steepest negative slope around the beginning of 2008, so the length of status updates will be shrinking the fastest around then.

d. [3 points] Is this function continuous? Is it invertible? Justify your answer.

Solution: The function is continuous since there are no gaps in the function over the domain given. However, it is not invertible because it attains the same value at the beginning of 2012 and the beginning of 2009, so it fails the horizontal line test and is not invertible.