

1. (4pts) If  $f(2) = -5$  and  $2 < f'(x) < 5$  for all  $x$ .

a) What is the largest possible value of  $f(4)$ ?

b) What is the smallest possible value of  $f(4)$ ?

2. (3pts) Mr. Colburn is driving along the highway. He gets on the highway at mile marker 0. After 2 hours he is 40 miles down the highway. If his speed never exceeds 45 miles per hour, how far along the highway can Mr. Colburn be after 5 hours? Justify your answer using a theorem.

3. (3pts) Does there exist a function  $f$  such that  $f'(x) > 2$  for all  $x$ ,  $f(2) = 10$ , and  $f(4) = 11$ ? Justify your answer.