

1. [8 points] Katie is biking on a long, straight path. Her distance, in kilometers (km), from the start of the path t minutes after she begins is given by the function $K(t)$. Some values of $K'(t)$, the **derivative** of $K(t)$, are given in the table below.

t	0	5	10	15	20
$K'(t)$	0	0.27	0.37	0.45	0.5

- a. [3 points] Estimate $K''(8)$. Show your work and **include units**.

Answer: $K''(8) \approx$ _____

- b. [1 point] Which **one** of the following statements best describes the first 20 minutes of Katie's ride? Circle the numeral of your answer.
- i. Katie started out slowly, but then began to speed up.
 - ii. Katie started out fast, but then began to slow down as she got tired.
 - iii. Katie rode at a steady speed for this part of her ride.
- c. [4 points] After 20 minutes, Katie has ridden for 7 km, and still has 2 km to go. Find a formula for $L(t)$, the linear approximation to $K(t)$ at $t = 20$, and use it to estimate the total amount of time Katie's bike ride will take.

$L(t) =$ _____

length of Katie's ride $\approx$ _____ minutes