(1) Times and positions of a bike rider are given in the table below.

Time (Seconds)	0	1	2	3	4	5	6
Position (Feet)	0	2.8	7.2	15.3	25.6	38.7	46.1

(a) Compute the average speed (in feet/second) of the rider during each of the following time intervals.
[1, 2] [2, 3] [3, 4] [4, 5] [5, 6]

(b) We want to approximate the rider's instantaneous speed at time $t = 2$ seconds. Compute the average speed of the rider during each of the following time intervals.
[2, 5] [2, 4] [2, 3]

(c) Which of the approximations from (b) is probably best? Why?

(d) Compute the average speed of the rider during the time interval [1, 3].

(e) How do you think this approximation compares to the approximation over the interval [2, 3]?

(f) What information would you need to find a better estimate of the rider's instantaneous speed at $t = 2$ seconds?

(2) Now, consider a simple model of the rider's position: $s(t) = t^2 + 3t - 1$. Use this model for the computations below.

(a) Compute the average velocity of the rider over each of the following intervals.
[2, 4] [2, 3] [2, 2.5]

(b) Any opinion about which of these approximations is closest to the rider's instantaneous speed at $t = 2$?

(c) Compute a better estimate for the rider's instantaneous speed at $t = 2$ seconds. Show your method.

(d) Compute an even better estimate for the rider's instantaneous speed at $t = 2$ seconds. Show your method.

(e) Explain how the expression $\frac{s(2+h) - s(2)}{h}$, with various values of h, gives approximations for the rider's speed at $t = 2$ seconds. Simplify this expression for the given model for position $s(t)$.

(f) What happens to this expression as h approaches 0?