

8. [9 points] Han is playing with a balloon. He blows it up and then lets it go without tying it and watches it fly straight upwards away from him. Let  $B(t)$  be the distance, in inches, of the balloon from Han  $t$  seconds after he releases it. You may assume  $B$  is invertible on the interval shown below.

$t$ (seconds)	0	0.2	0.6	0.8	0.9	1.2	1.4	1.6
$B(t)$ (inches)	0	0.6	1.0	1.4	1.8	2.4	2.8	3.1

- a. [2 points] What is the average velocity of the balloon over the first 0.8 seconds of its flight? Show your work and include units.

**Answer:** \_\_\_\_\_

- b. [2 points] Estimate the instantaneous velocity of the balloon 1.45 seconds after Han releases it. Show your work and include units.

**Answer:** \_\_\_\_\_

- c. [3 points] What is the average rate of change of  $B^{-1}$  over the interval  $[0.6, 1.4]$ ? Show your work and include units.

**Answer:** \_\_\_\_\_

- d. [2 points] Over which of the following intervals could  $B(m)$  be linear? Circle all possible intervals.

$0 \leq m \leq 0.6$        $0.6 \leq m \leq 0.9$        $0.9 \leq m \leq 1.4$        $1.4 \leq m \leq 1.6$       NONE OF THESE