4.1 Interpreting the Meaning of the Derivative

Calculus Name: _____ **CA #1**

For each problem, a differentiable function is given along with a definition of the variables. Interpret the values in the context of the problem.

1. A file is downloaded to a computer at a rate modeled by $f(t)$, where t is the time in seconds since the start of the download and $f(t)$ is measured in megabits per second. Interpret $f'(13) = 25$.

2. The rate of change of a short-distance track runner is modeled by $r(t)$, where r is measured in feet per second and t is seconds. Interpret $r'(0.5) = 2$.

3. The rate of water leaking from a tank, in gallons per hour, is modeled by $R(t)$, where t is measured in hours. Interpret $R'(1) = 23$.

4. The number of bees in a beehive at time t days is modeled by the function $b(t)$. Interpret $b'(30) = 15$.

5. The rate of consumption of gasoline of Mr. Kelly's station wagon can be modeled by $f(t)$, where f is measured in gallons per hour and t is hours. Interpret $f'(1) = 1.2$.

6. The number of mistakes Mr. Brust makes in his math packets is modeled by $m(p)$ where p is the number of packets he has completed so far this year. Interpret $m'(10) = 13$.

7. The height of someone riding on a Ferris wheel t minutes after the ride begins is modeled by $h(t)$ where h is measured in feet. Interpret $h'(3) = 45$.

8. The time it takes for a sample of water to evaporate can be modeled by $t(S)$, where t is time, in minutes, and S is the size of the sample, measured in milliliters. Interpret $t'(208) = 0.9$.

Answers to 4.1 CA #1

1. At 13 seconds, the rate the file is downloading is increasing by 25 megabits per second per second.	2. At 0.5 seconds, the rate of the runner is increasing by 2 feet per second per second.	3. At 1 hour, the rate of water leaking is increasing by 23 gallons per hour^2.
4. On the 30th day, the number of bees is increasing by 15 bees per day.	5. After 1 hour, the rate of consumption of gas is increasing by 1.2 gallons per hour per hour.	6. While making the 10th packet, Mr. Brust is making 13 mistakes per packet.
7. On the 3rd minute, the height is changing by 45 feet per minute.	8. When there are 208 milliliters, the water is evaporating at a rate of 0.9 milliliters per minute.	