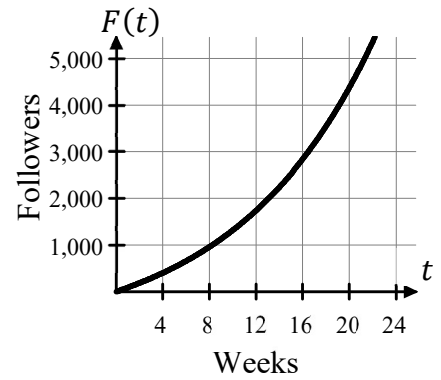


1.1 Can change occur at an instant?

Calculus

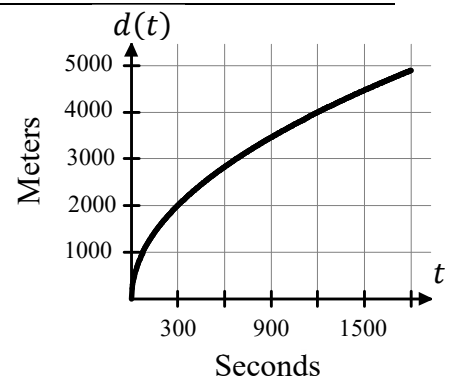
Name: _____

1. Mr. Bean wants to be a social influencer. The number of followers he has for his social media platform can be modeled by the function F , where $F(t)$ gives the number of followers and t gives the number of months since he created his account for $0 \leq t \leq 24$. The graph of the function F is shown to the right.



- Draw a tangent line at $t = 16$.
- Give a rough estimate of the instantaneous rate of change at $t = 16$.
- Give an example of how to calculate a rate of change that would give a close estimate to the instantaneous rate of change at $t = 8$.

2. A jogger's distance while on a run can be modeled by the function d , where $d(t)$ gives the distance the jogger has ran in meters and t gives the number of seconds the jogger has been running for $0 \leq t \leq 1800$. The graph of the function d is shown to the right.



- Draw a tangent line at $t = 150$.
- Give a rough estimate of the instantaneous rate of change at $t = 150$.
- Give an example of how to calculate a rate of change that would give a close estimate to the instantaneous rate of change at $t = 900$.

3. The number of graduating seniors at a high school can be modeled by G , where $G(t)$ is the number of graduates and t is the year since 2005 for $0 \leq t \leq 25$.

- | | | |
|--------------------------------|---|---|
| a. What does $G(6)$ represent? | b. What does $\frac{G(6)-G(1)}{6-1}$ represent? | c. What does $\frac{G(6)-G(5.999)}{6-5.999}$ represent? |
|--------------------------------|---|---|

4. A hurricane has formed in the Atlantic Ocean and is headed towards Miami. It's distance from Miami can be modeled by H , where $H(t)$ is the miles from Miami and t is the hours since Monday morning at 9:00 a.m. for $0 \leq t \leq 96$.

- | | | |
|---------------------------------|---|---|
| a. What does $H(24)$ represent? | b. What does $\frac{H(48)-H(24)}{48-24}$ represent? | c. What does $\frac{H(50)-H(49.999)}{50-49.999}$ represent? |
|---------------------------------|---|---|

Answers to 1.1 CA #2

1a. check graph. 1b. ≈ 250 followers per week. 1c. $\frac{F(8)-F(7.999)}{8-7.999}$		2a. check graph. 2b. ≈ 333 meters per second. 2c. $\frac{d(900)-L(899.999)}{900-899.999}$	
3a. The number of graduates in 2011.	3b. The average number of graduates per year from 2006 to 2011.	3c. The rate of change of graduates per year in 2011.	
4a. Miles from Miami after 24 hours.	4b. The average mph between the 24 th and 48 th hour.	4c. The speed of the hurricane (in mph) at the 50 th hour.	