



BC.Q404.REVIEW ASSESSMENTS

(Part 2)

CH 5A (REVISITED) – FTC2 APPLICATIONS

(20 points)

CALCULATOR PERMISSION
VARIES

NAME:

DATE:

BLOCK:

I (*print name*) _____ certify that I wrote and fully understand **all** marks made in this assessment. I did not write anything that I do not understand. I would now, having completed this assessment, be able to make similar (but equally accurate) responses if asked complete the same exact assessment on my own.

Signature:

1 (CALCULATOR ACTIVE). A particle starts at $x(0) = 3$ and moves along the x -axis with velocity $v(t) = 0.5 - \sin(e^t)$ m/s for $0 \leq t \leq 2$.

A. What is the total distance traveled by the particle at time $t = 2$? Show the work that leads to your conclusion.

B. Where is the particle at $t = 2$? Show the work that leads to your conclusion.

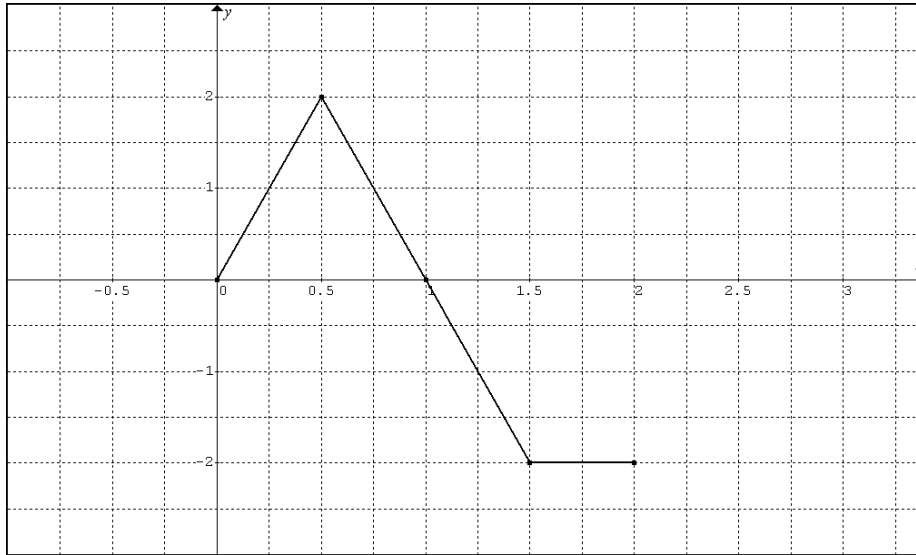
C. What are the velocity and acceleration of the particle at time $t = 0.2$?

D. Is the speed of the particle increasing or decreasing time $t = 0.2$? Justify your answer.

E. When is the particle moving to the right? Justify your answer.

F. What are the average velocity and average acceleration over the first 2 seconds? Show reasoning.

2. (NO CALCULATOR) A particle starts at $x(0) = 10$ and moves along the x -axis with velocity $v(t)$ (m/s), whose graph is given below for $0 \leq t \leq 2$.



A. What is the total distance traveled by the particle at time $t = 2$? Show the work that leads to your conclusion.

B. Where is the particle at $t = 2$? Show the work that leads to your conclusion.

C. What are the velocity and acceleration of the particle at time $t = 0.2$?

D. Is the speed of the particle increasing or decreasing time $t = 0.75$? Justify your answer.

E. When is the particle moving to the right? Justify your answer.

3 (CALCULATOR ACTIVE). A 20-gallon kiddie pool has 15 gallons of water at 8:00 am ($t = 0$). A hole in the pool makes the water drain at the rate of $f(t) = 13 \cdot \ln(t + 2)$ gallons an hour. At 8:00 am, a dad puts a hose into the pool which adds water at the rate $r(t) = \begin{cases} e^{-t}; & 0 \leq t \leq 0.5 \\ 25; & t > 0.5 \end{cases}$.

Include the set up for each problems below:

- A. How much water drained from the pool between 8:00am and 8:30am?

- B. How much water was added to the pool between 8:00am and 8:30am?

- C. How much water is in the pool at 8:30am?

- D. Write an equation, without an integral expression, for the amount of water in the pool at any time t between 8:00am and 8:30am.

- E. How much water drained from the pool between 8:00am and 9:00am?

- F. How much water was added to the pool between 8:00am and 9:00am?

- G. How much water is in the pool at 9:00am?

- H. Set up, but do not solve, an equation used to find the answer to the following question:
If the water hose is not removed from the pool, then when will it begin to overflow?