

*MC: Skip #1*

*FR: Do #11 and 12 (with calculator  
all parts)*



*Day 6: Graphing Calculator*

**AP Calculus Quiz Practice**  
Graphing Calculator

A particle is moving along the x-axis on the time interval  $[0,8]$ . The velocity of the particle is given by  $v(t) = 2\sin(e^{t/4}) + 1$  and  $x(0) = 2$ .

1. Find the acceleration at $t = 4$ . $v'(4) = -1.239$	2. At what time(s) does the particle change direction? $v(t) = 0$ $t = 5.196, 7.003$
3. Find the position of the particle at $t = 8$ . $x(8) = 2 + \int_0^8 v(t) dt = 14.407$	4. Find the time(s) when the particle's acceleration is zero. $a(t) = v'(t) = 0$ $t = 1.806, 6.201$
5. Find the total distance traveled on $[0,8]$ $\int_0^8  v(t)  dt = 14.756$	6. Find the average velocity on $[0,8]$ $\frac{1}{8} \int_0^8 v(t) dt = 1.551$

Given  $f(x) = 2x\sin(2x)$  for  $0 < x < 3$

7. State the x-value(s) of the local minimum(s). at rel. min of $f(x)$  $x = 2.457$ $f'(x) = 0$ and $f'(x)$ changes from neg. to pos. $x = 2.457$	8. State the interval(s) where the function is decreasing. $f(x)$ is decr.  $f'(x) < 0$ $(1.014, 2.457)$
9. Find the x-coordinate(s) of the points of inflection. $f'(x) = 0$ (rel. extrema) $f''(x) = 0$ sign change .538, 1.822	10. State the interval(s) where the function is concave down. $f''(x) < 0$ $x = .538$ to $x = 1.822$

Answers (rounded to 3 decimal places)

- $a(4) = 1.822$
- $t = 1.806, 6.201$
- $x(8) = 14.407$
- $t = 4.925, 7.448$
- 14.756
- 1.551
- $x = 2.457$
- $(1.014, 2.457)$
- $x = 0.538, 1.822$
- $(0.538, 1.822)$