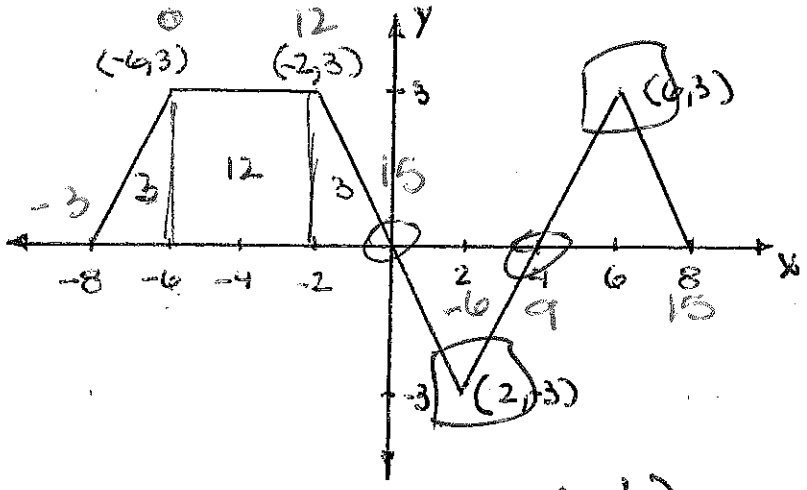
AB Calculus Quiz #14 FRQ
Integration Stuff
Dr. Wisniewski Spring 2020

Name Solution Bajbabii Ei **Period** _____

Instructions: Solve the problem below. Please do your work on another sheet of paper and staple it to this cover sheet. A calculator is NOT permitted on this portion of the quiz.



graph of f (g')

The figure above shows the graph of a piecewise-linear function f. For $-8 \leq x \leq 8$, the function g is defined by $g(x) = \int_{-6}^{x} f(t)dt$.

a. (3 Pts) Find the values of $g(0), g(-8)$ and $g'(2)$.

b. (2 Pts) Identify the x-coordinate(s) for which g has a local minimum. Justify your answer.

c. (2 Pts) State the largest open interval(s) on which g is decreasing and concave down. Justify your answer.

d. (2 Pts) Find the absolute maximum value of g on the closed interval $[-8, 8]$. Justify your answer.

e. (2 Pts) Find the x-coordinate(s) for all points of inflection on the graph of g. Justify your answer.

AB calc @#4 soln FRQ

a. $g(0)$ $\quad g(0) = \int_{-6}^{0} f(t)\,dt = \boxed{15}$

(3pts) $g(-8)$ $\quad g(-8) = \int_{-6}^{-8} f(t)\,dt = -\int_{-8}^{-6} f(t)\,dt = \boxed{-3}$

$g'(2) = f(2) = \boxed{-3}$

b. $\boxed{g \text{ has a local min @ } x=4.}$ $g'(x)$ (or $f(x)$) changes

(2pts) from neg to pos @ $x=4$ $\therefore$ g has a local min @ $x=4$

C. g is decr & concave down where g' is neg and

(2pts) decr. this occurs on $(0,2)$ or $0<x<2$

D. g has abs max of 15 at both $x=0$

(2pts) and $x=8$.

E. g has POI where g' goes from decr to incr or incr to decr. this occurs at $x=2$ & $x=6$

2pts

→ use closed-interval method.
Find g at endpts & crit pts
∴ we need

$g(-8) = -3$ (from #a)
$g(0) = 15$ (from #a)
$g(4) = 9$
$g(8) = 15$

∴ 15 is absolute Maximum & it occurs at both $x=0$ and $x=8$.