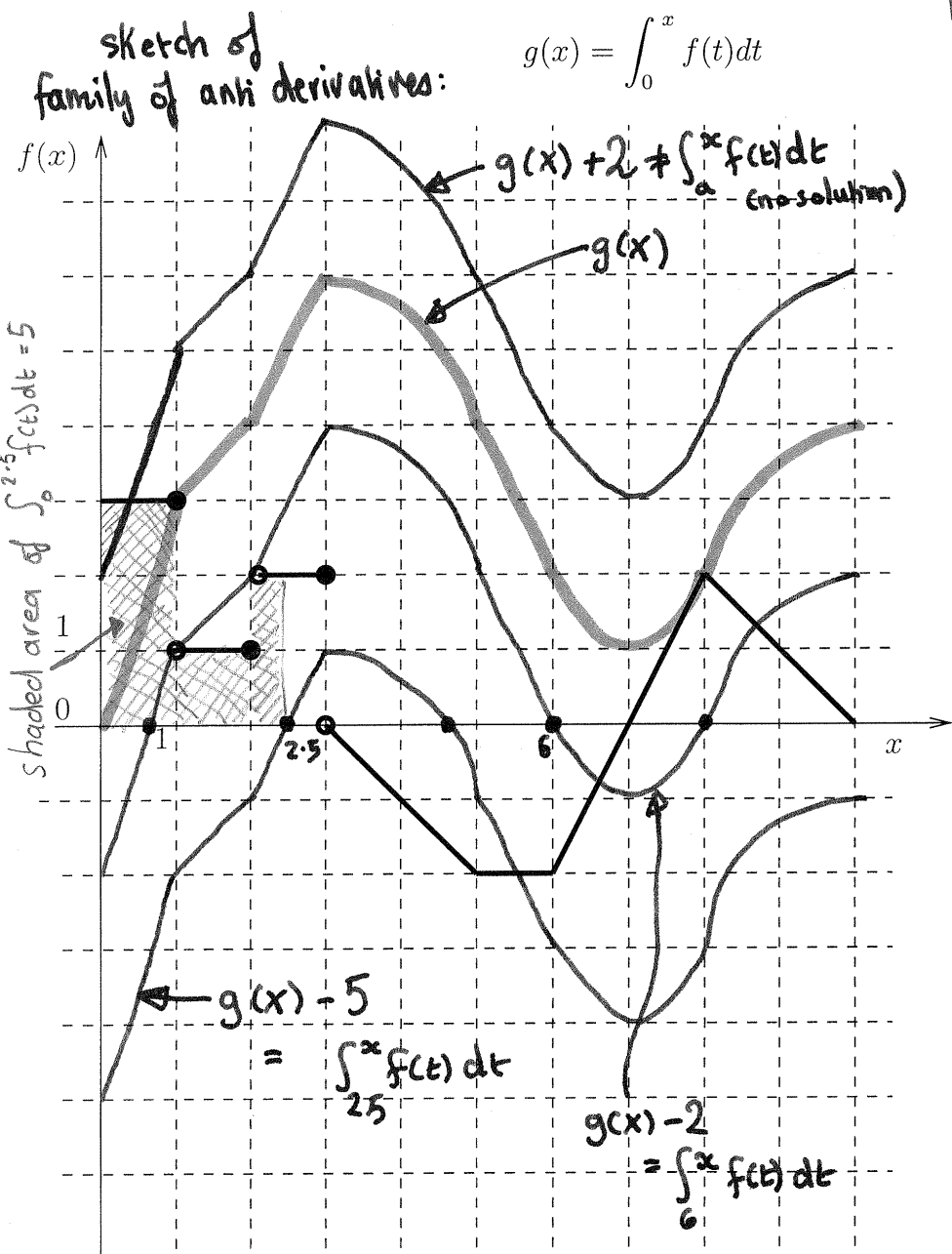


# STUDENT NAME:

Calculus 1550, section 20. Tuesday, November 18, 2003. Twenty-fifth quiz.

Below the graph of a function  $f(x)$  is sketched.

1. [6 points] On the same grid, Sketch a graph of the function



## Further remarks

for any constant  $a$ ,

$\int_a^x f(t) dt$  is always an anti derivative of  $f(x)$ .

Different anti derivatives just differ by a constant, and correspond to different choices of  $a$ . (assuming  $\int_0^x f(t) dt = C$  has a solution)

In this example,  $g(x)$  is an anti deriv of  $f(x)$ .

Note,

$$\begin{aligned} \int_0^x f(t) dt &= [g(t)]_0^x \\ &= g(x) - g(0) \\ &= g(x) \end{aligned}$$

( $g(0) = 0$ )

$$\begin{aligned} \text{and } \int_a^x f(t) dt &= [g(t)]_a^x \\ &= g(x) - g(a) \end{aligned}$$

so if  $\int_a^x f(t) dt = g(x) - 5$ ,  
we must have  $g(a) = 5$   
ie  $\int_0^a f(t) dt = 5$   
ie in this example,  
 $a = 2.5$  or  $4.5$

2. [1 point] What is the maximum value of  $g(x)$  on  $[0, 10]$ ?

3. [1 point] What is the minimum value of  $g(x)$  on  $[0, 10]$ ?

4. [2 points] Suppose

$$\int_a^x f(t) dt = g(x) - 5$$

What is  $a$ ?