Math 251 Fall 2017   **Quiz #11, November 29th**

Name: ————————————————————————

There are 25 points possible on this quiz. This is a closed book quiz. Calculators and notes are not allowed. **Please show all of your work!** If you have any questions, please raise your hand.

Exercise 1. (3 pts.) Let $g(x) = \int_0^x f(t)dt$ where the graph of $y = f(t)$ is displayed below.
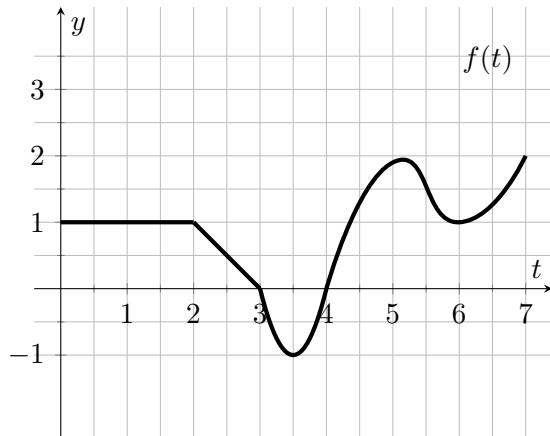
(a) Find $g(3)$

(b) In the open interval $(0, 7)$, when does $g(x)$ have a maximum?

(c) When is $g(x)$ increasing?

Exercise 2. (5 pts.) Find the derivative of the function.

(a) $g(x) = \int_x^2 \sin t \, dt$

(b) $F(x) = \int_0^{x^2} \sqrt{2 + t^3} dt$

Exercise 3. (3 pts.) What, if anything, is wrong with the following calculation?

$$\int_0^5 \frac{1}{x - 3} dx = \ln |x - 3| \Big|_0^5 = \ln 2 - \ln 3 = \ln \left(\frac{2}{3} \right)$$

Exercise 4. (6 pts.) Evaluate the following integrals.

(a) $\int_0^{\pi/4} (2\sec^2 t - e^t)dt$

(b) $\int_0^{1/2} \frac{2}{\sqrt{1-x^2}}dx$

Exercise 5. (8 pts.) Evaluate the following integrals.

(a) $\int_0^1 (v^2 + 3)^2 dv$

(b) $\int_1^9 \frac{(3-t)}{\sqrt{t}}dt$