Name: _____ _____ / 25

25 points possible. You may use other sources (books, calculator, friends, etc) but your write up must be your own. The complete quiz is due Monday Dec 2, 2019 at the beginning of class.

1. [6 points] Use Part I of the Fundamental Theorem of Calculus to find the derivative of the function.

a. $g(x) = \int_2^x e^t \cos(t^2)dt$

b. $A(x) = \int_{-1}^{x^3} t\ln(3+t^2)dt$

2. [9 points] Evaluate each integral below. Assume a, b, ad c are fixed constants.

a. $\int_0^3 (ax^2 - bx + 3c)dx$

b. $\int_0^{\pi/6} \sin(\theta)d\theta$

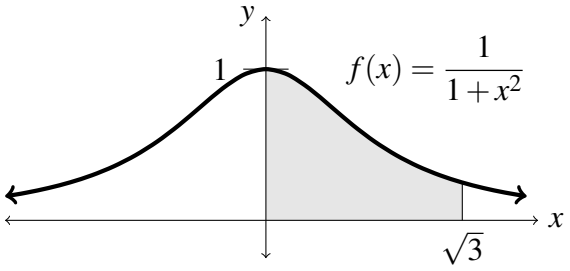
c. $\int_0^4 |x-2|dx$ (Hint: Interpret as area, sketch a picture, and compute.)

3. [4 points] Let $v(t)$ be the velocity (in meters per second) of a particle moving along a line starting at $t = 0$.

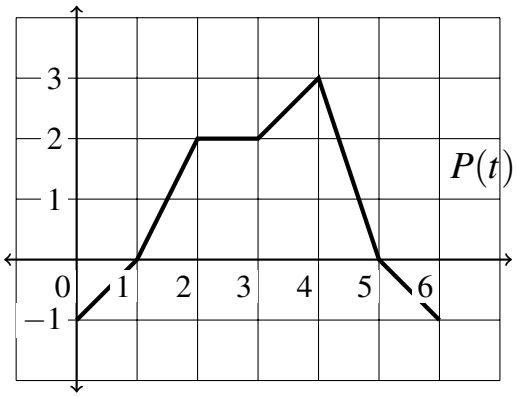
a. What does $\int_1^4 v(t)dt$ represent?

b. Is it possible for $\int_1^4 v(t)dt$ to be negative? Justify your answer.

4. [3 points] Find the **exact** value of the area shaded below. Show your work.



5. [3 points] Let $Q(x) = \int_0^x P(t)dt$, where $P(t)$ is the function whose graph is shown below.



a. Find $Q(2)$

b. On what interval is $Q(x)$ increasing?

c. Where does $Q(x)$ have a maximum?