Name: _____

PID: _____

TA: _____

Math 10B: Practice Midterm 1

Turn off and put away your cell phone.

No calculators or any other electronic devices are allowed during this exam.

You may use one page of notes, but no books or other assistance during this exam.

Read each question carefully, and answer each question completely.

Show all of your work; no credit will be given for unsupported answers.

Write your solutions clearly and legibly; no credit will be given for illegible solutions.

If any question is not clear, ask for clarification.

You have 50 minutes.

1. Use the fundamental theorem of calculus to find $g'(x)$ for the following

(a) $g(x) = \int_x^1 \frac{t^2}{1+t^2} dt$

(b) $g(x) = \int_a^{x^4} \sin t \cos t\, dt$

2. $\int_{-1}^3 4 + |2x - 2| dx$

3. Evaluate the $\int_{-2}^{4} f(x)dx$ by interpreting it in terms of **areas** where

$$f(x) = \begin{cases} \sqrt{4 - x^2} & \text{for } -2 < x < 2 \\ 2 - x & \text{for } \quad 2 < x < 4 \end{cases}$$

4. Find $f(t)$ given that $f''(t) = 2t^4 + \sin 2t$ and $f(0) = 2$ and $f'(0) = -4$.

5. A person is riding a bike at $20mi/hr$ and starts slowing down producing a constant deceleration of $5mi/hr^2$. What is the distance traveled before the bike comes to a stop?

6. Use the properties of integrals to evaluate the following

(a) $\int_5^2 (t+1)(2t-2)dt$.

(b) $\int_0^{\frac{\pi}{2}} \sin u + \cos u \, du$.

(c) If $\int_a^b f(t)dt = 5$, find $\int_a^c 2f(t)dt + \int_c^b 2f(t)dt$.

7. Evaluate the indefinite integral $\int \frac{3x+3}{2+2x^2}dx$.

8. Estimate $\int_0^{\frac{\pi}{2}} \sin(t)dt$ using a comparison property of integrals.