Name: _____ _____ / **25**

There are 25 points possible on this quiz. No aids (book, calculator, etc.) are permitted. **Show all work for full credit.**

1. **[3 points]** For the function $F(x) = \int_3^{x^2} \sqrt{t}\, dt$, use the Fundamental Theorem of Calculus to find $F'(x)$.

$F'(x) =$

2. **[9 points]** Evaluate the definite integrals below. Use proper notation and simplify your answers.

   a. $\int_0^2 (3e^x + 2)\, dx$

   b. $\int_1^3 t(t-2)\ dt$

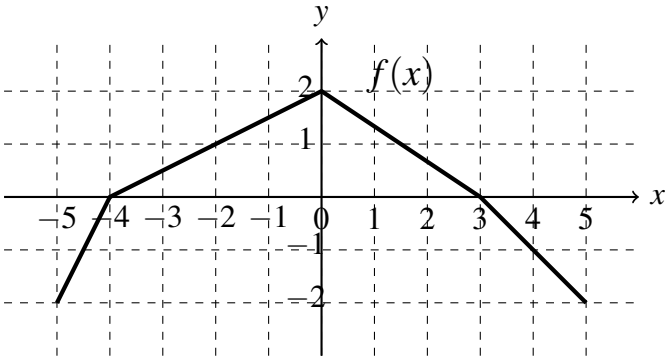
   c. $\int_0^{\pi} (2\sin(x) + 3\cos(x))\ dx$

3. [8 points] Evaluate the following indefinite integrals (antiderivatives) below. Clearly state any substitutions you use and write your final answer in terms of x.

a. $\displaystyle\int \frac{\sin(\ln(x))}{x}\,dx$

b. $\displaystyle\int \frac{-3x^2+\sin(x)}{x^3+\cos(x)}\,dx$

4. [5 points] Use the graph of $f(x)$ (below) to answer questions about $A(x)=\displaystyle\int_{-5}^{x} f(t)\,dt$.



a. $A(-2)=$ _____

b. $A(4)=$ _____

c. $A'(0)=$ _____

d. On the interval $[-5,5]$, where does $A(x)$ have a maximum or minimum?

Maximum at $x=$ _____

Minimum at $x=$ _____