Math 132: Calculus for the Physical & Life Sciences 2

Spring 2006

Practice Questions for Midterm 1

1. Compute the following:

   (a) $\displaystyle\int 2x(x^2+5)^{7/2}\,dx$

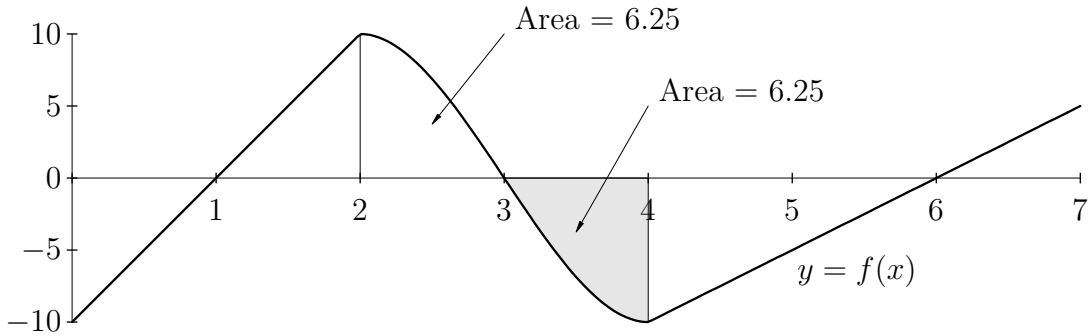
   (b) $\displaystyle\int \sin(3\theta)\,d\theta$

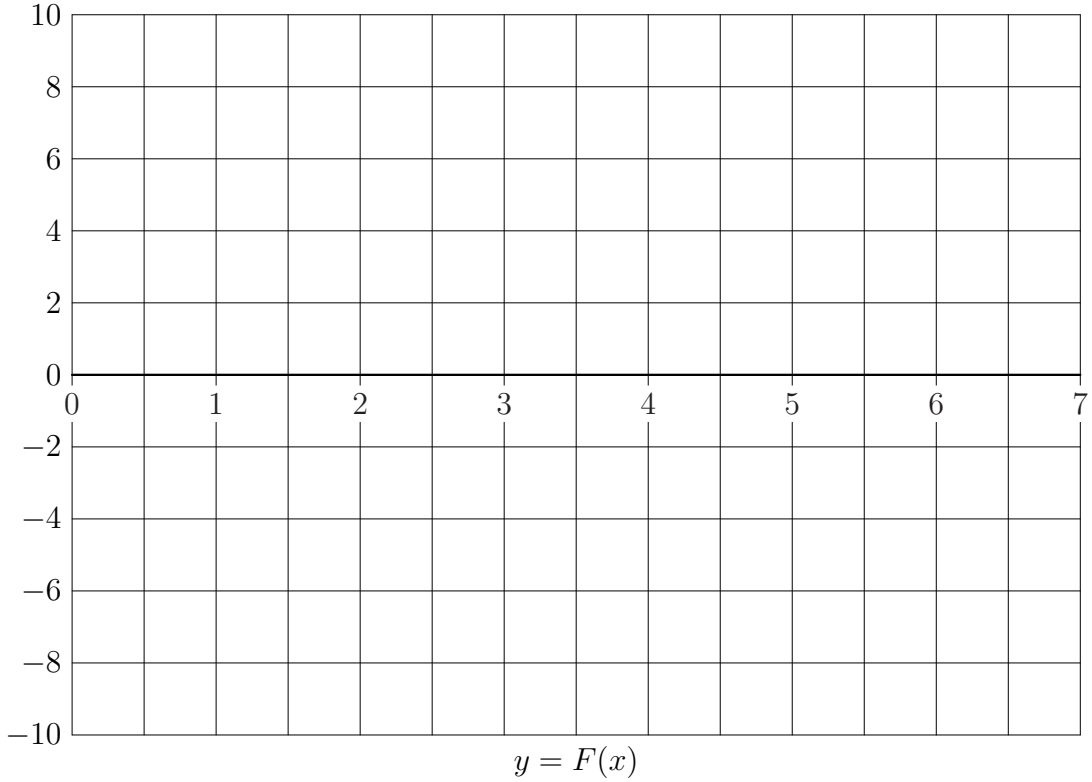
   (c) $\displaystyle\int \frac{dx}{2x+1}$

   (d) $F'(x)$, where $F(x) = \displaystyle\int_{\pi}^{x} \frac{t}{1+\sin^2 t}\,dt$

2. The graph $y = f(x)$ is shown. Let F be the antiderivative of f satisfying $F(2) = 0$. Find the indicated values, and carefully sketch the graph $y = F(x)$ in the grid provided.

   $F(1) =$ $F(3) =$ $F(4) =$ $F(6) =$





$y = F(x)$

3. A drag racer accelerates at $a(t) = (20 + t)$ ft/sec^2.

   (a) How fast is the car traveling after 6 seconds? (The car is initially at rest.)

   (b) How far has the car traveled after 6 seconds?

4. Find the integrals. Use the indicated method to get started.

   (a) $\displaystyle\int_1^4 \frac{\sqrt{1+\sqrt{x}}}{\sqrt{x}}\,dx$ (Substitution)

   (b) $\displaystyle\int t\sec^2 t\,dt$ (Integrate by parts)

5. Compute the integrals

   (a) $\displaystyle\int \frac{dx}{(4-x^2)^{3/2}}$

   (b) $\displaystyle\int \frac{dx}{x^2+4x+8}$

6. Find the indefinite integral $\displaystyle\int \frac{x^2+1}{x(x+2)(x-1)}\,dx$

7. Compute any **two** of the following; clearly mark your choices and indicate the method of integration.

   (i) $\displaystyle\int \frac{1}{\sqrt{1-x^4}}\,dx$ (ii) $\displaystyle\int \frac{x}{\sqrt{1-x^4}}\,dx$ (iii) $\displaystyle\int \frac{x^2}{\sqrt{1-x^4}}\,dx$ (iv) $\displaystyle\int \frac{x^3}{\sqrt{1-x^4}}\,dx$