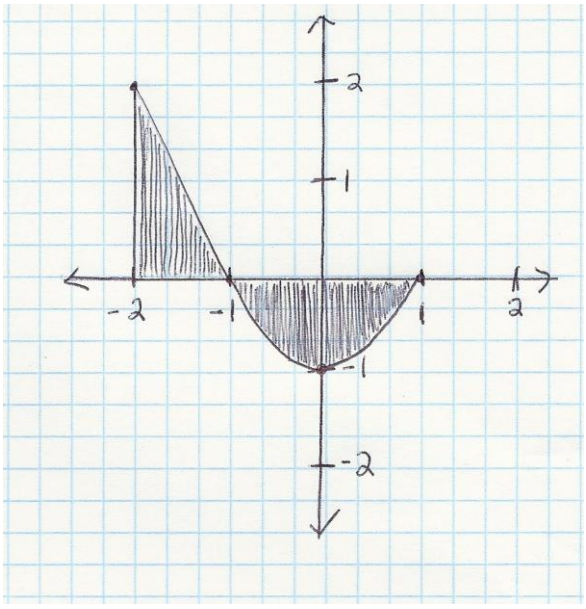
Practice for Test #3 Calculus A Dr. Johnson

Caution: You should not limit your studying for Test 3 to only the types of problems presented below. This practice test is not a comprehensive review of every type of problem that could be on the test.

1. Assume that f is continuous on [1,7] and that $\int_1^5 f(x)dx = 1$; $\int_2^3 f(x)dx = -1$; $\int_3^5 f(x)dx = 1$; and $\int_3^7 f(x)dx = 6$. Evaluate each of the following:

   a) $\int_1^3 f(x)dx$ b) $\int_1^2 f(x)dx$ c) $\int_1^7 f(x)dx$ d) $\int_7^5 f(x)dx$

2. What is the average value of $f(x) = x^3 + 2$ on [0,3].
3. What integral would be used to find the area of the region shown?



a) $\int_{-2}^{1} f(x)dx$

b) $\int_{-2}^{-1} f(x)dx + \int_{-1}^{1} f(x)dx$

c) $\int_{-2}^{-1} f(x)dx - \int_{-1}^{1} f(x)dx$

d) $\int_{1}^{-2} f(x)dx$

e) none of the above

Evaluate each definite or indefinite integral.

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

5. $\int \frac{e^{1/x}}{x^2} dx$

6. $\int \frac{3x-2}{x} dx$

7. $\int_{\pi/6}^{\pi/2} \cos^2 y \sin y \, dy$

8. $\int \frac{e^x}{1+e^{2x}} dx$ (Hint: $e^{2x} = (e^x)^2$)

9. $\int \frac{t}{3t^2 - 7} dt$

10. $\int_{0}^{\pi/4} \frac{\sec^2 x}{(\tan x + 1)^2} dx$

11. $\int t^3 (2 - 5t^4)^7 \, dt$

12. $\int \sqrt[3]{8x^7} \, dx$

13. $\int t^3 \ln t \, dt$

14. If $\int_{0}^{x} f(t)\, dt = x^2 + \cos x - 1$, then $f(t) =$ _____.

15. If $F(x) = \int_{x}^{3} \left(\frac{1}{1+t^2} \right)^2 dt$, find $F'(x)$.