

Prob | Pts

Math 121

Calculus II

Spring 2006

Test #2

Name: _____

Section 1 2 3 4

Instructor: _____

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This exam is CLOSED NOTES and CLOSED BOOK. There are NO CALCULATORS allowed. To get full credit you must show all work neatly in the space provided on the test paper.

1. (**32 pts**) Evaluate the following integrals.

a. $\int (x^2 + x - 2)(1 - x) dx.$

Total

b. $\int x^2 \sqrt{1 - 3x^3} dx$

c. $\int \frac{x^2 + x - 2}{1 - x} dx.$

d. $\int \frac{\sqrt{x} + x^2 - x^{3/2}}{\sqrt{2x}} dx$

2. (24 pts) Evaluate the following integrals.

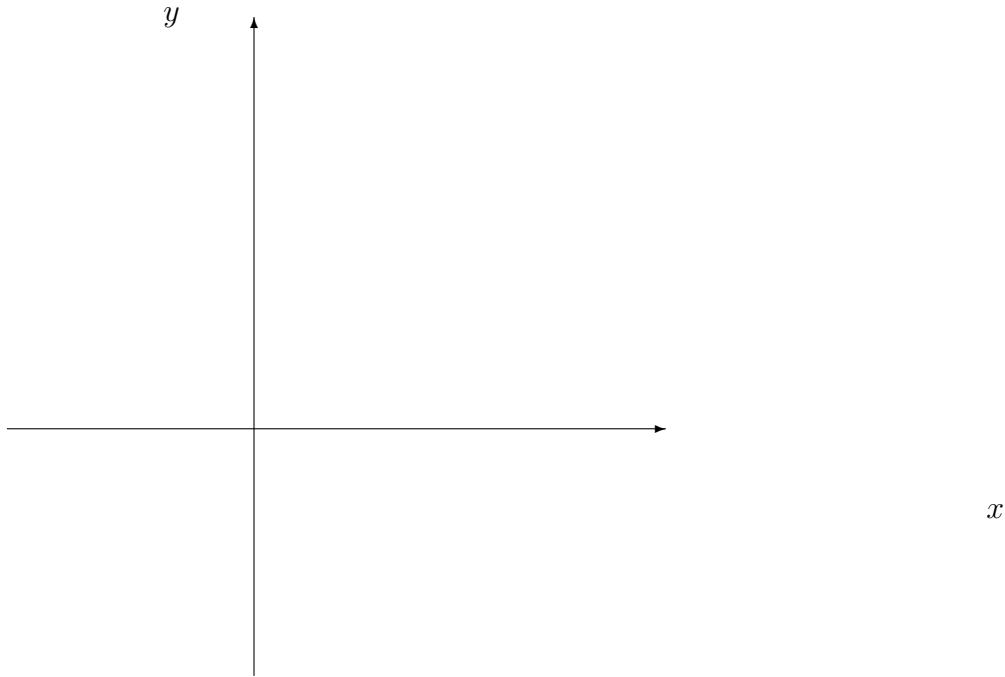
a. $\int_0^{\pi/2} \sin(2x) \cos(2x) dx$

b. $\int_0^{\pi/4} \frac{\sec(x) \tan(x)}{1 + \sec^3(x)} dx$

c. $\int_0^1 \frac{x}{\sqrt{x+1}} dx.$

3. (12 pts.) Consider the curves $y = x^2 - 2x$ and $y = 4 - 2x$.

a. Determine the intersection points and sketch the region they bound.



b. Find the area of the region by integrating with respect to x .

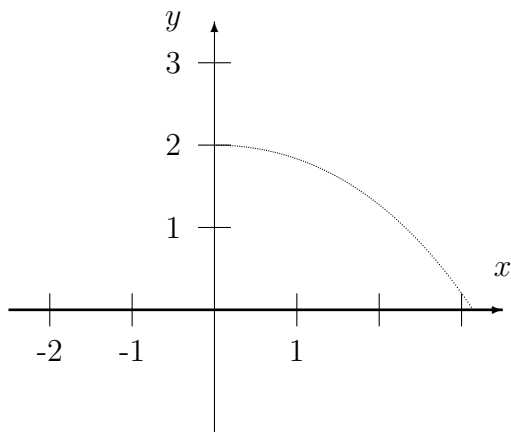
c. Write down, BUT DO NOT EVALUATE, an integral (or integrals) which express the area of the region, integrating *with respect to* y .

4.(32 pts.) Consider the region sketched below, which is bounded by $y = 2 \sin(x/2)$, $y = 0$ and $x = 0$.

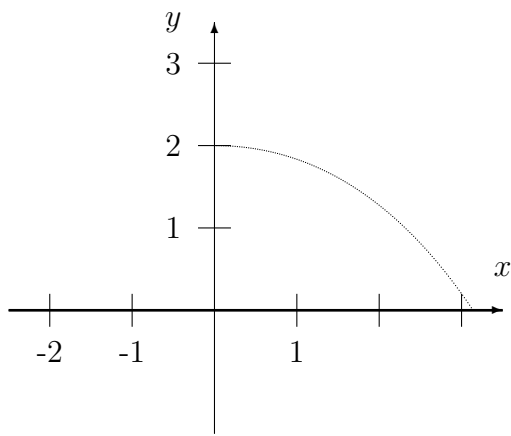
For each of the axes below, set up the integral which gives the volume of rotation about that axis *with respect to x* . In each case determine the shape of the volume element (disk, washer or shell) and indicate its dimensions.

[ALL integrals with respect to x . Do NOT evaluate these integrals.]

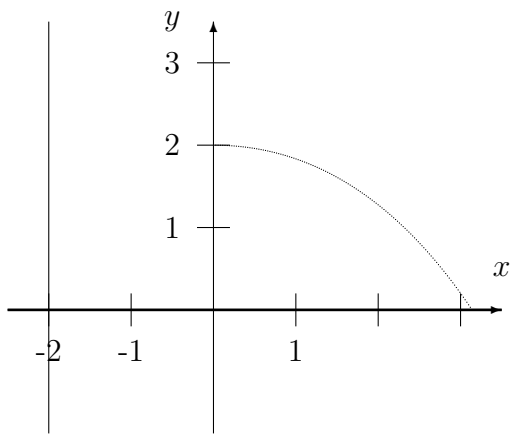
a. The x -axis:



b. The y - axis.



c. The axis $x = -2$:



d. The axis $y = 3$.

