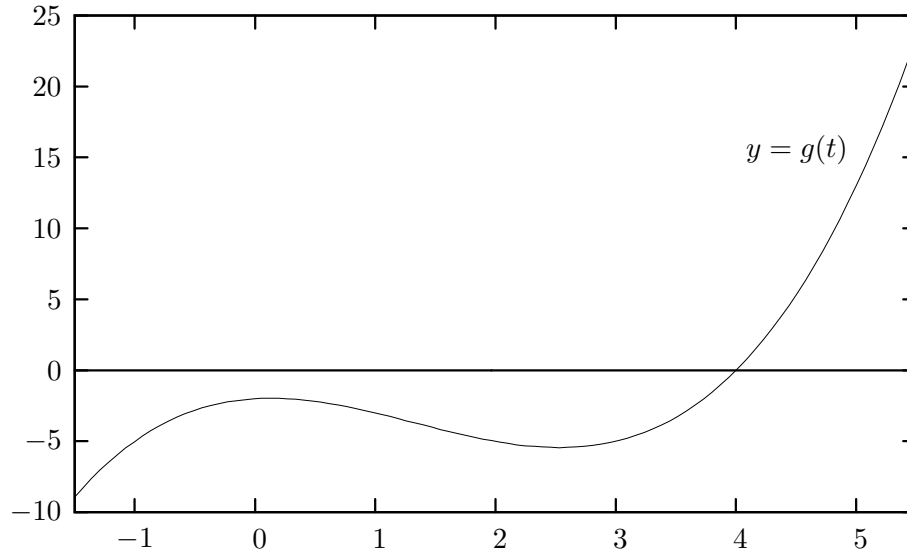


**Problem 1.** The picture below shows the graph of a function  $g$ .

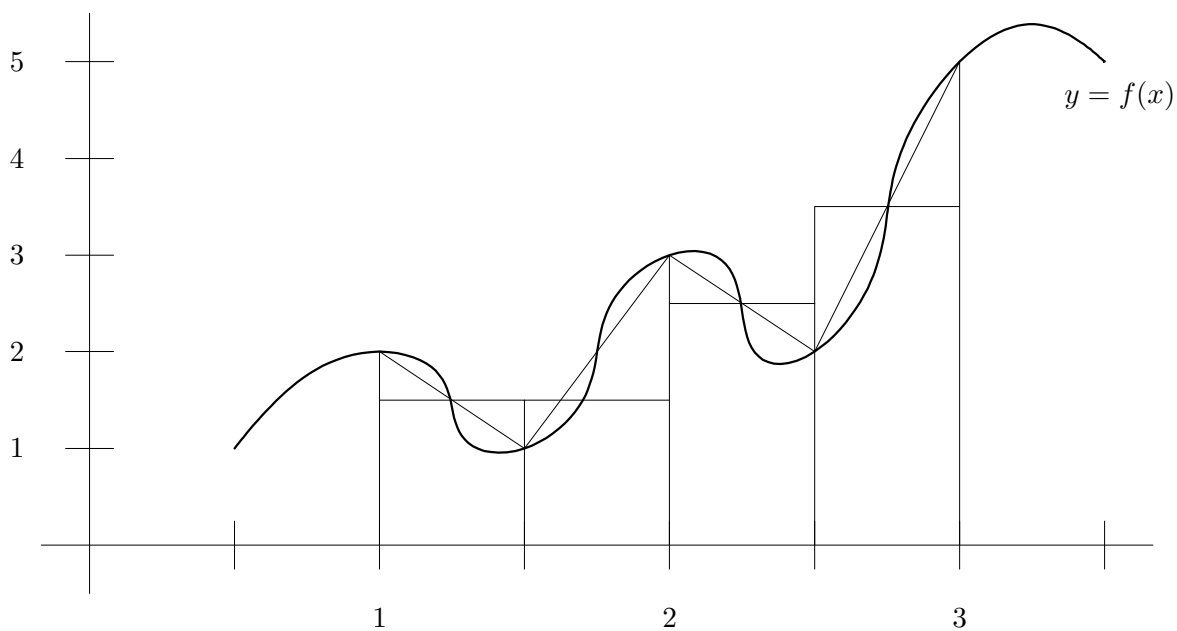


(a) [10 points] Find  $\int_{-1}^5 g'(t) dt$ .

(b) [10 points] Let  $A(x) = \int_1^x g(t) dt$ . Find  $A'(2)$ .

**Problem 2.** [20 points] Determine whether  $\int_1^{\infty} \frac{\sin^2(x)}{x^3} dx$  converges or diverges. Justify your answer completely.

**Problem 3.** Below is a sketch of  $y = f(x)$ . The polygonal paths may make it easier to approximate  $\int_1^3 f(x)dx$ .



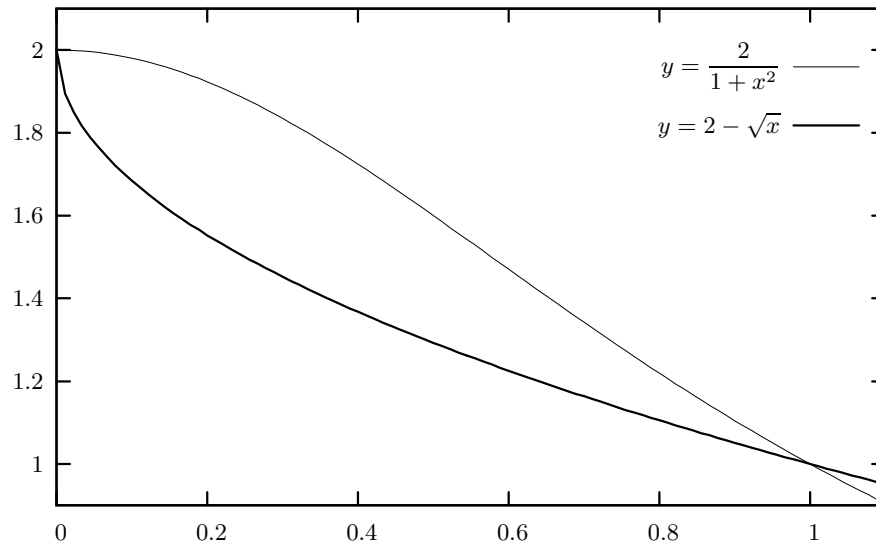
(a) [10 points] Use the trapezoid rule with  $n = 4$  to approximate  $\int_1^3 f(x)dx$ .

(b) [10 points] Use the midpoint rule with  $n = 4$  to approximate  $\int_1^3 f(x)dx$ .

**Problem 4. [20 points]** Consider the region trapped by the two curves

$$y = \frac{2}{1+x^2} \text{ and } y = 2 - \sqrt{x}$$

between the points  $(0, 2)$  and  $(1, 1)$ . Here is a sketch showing the region:



Use an integral to express the volume of the solid formed by rotating this region around the  $y$ -axis. Do not evaluate the integral.

**Problem 5.** [5 points each] Matching. Put the letter that matches the answer on the line. You need not show your work.

• \_\_\_\_\_  $\int_{-1}^3 \frac{dx}{x^2}$

• \_\_\_\_\_  $\int_0^1 x\sqrt{1-x^2}dx$

• \_\_\_\_\_  $\int_{-\frac{1}{2}}^0 3y e^{-2y} dy$

• \_\_\_\_\_  $\int_{-1}^1 \sqrt{1-t^2}dt$

(a)  $-\frac{3}{4}$

(b)  $\frac{\pi}{2}$

(c)  $\infty$

(d)  $\frac{1}{3}$

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# EXAM

Midterm 1

Math 132

Tuesday February 24, 2004

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- Name .....
- Student ID .....
- Lecture Section .....
- Recitation Section .....

1	/20
2	/20
3	/20
4	/20
5	/20
total	/100