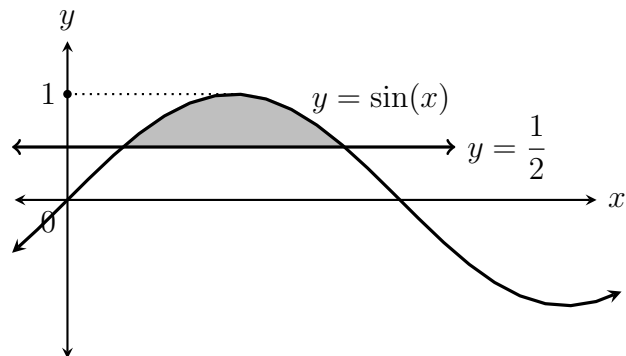


Name: \_\_\_\_\_

TEST 1 ♣  
February 13, 2024

MATH 201  
R. Hammack

1. Find the area of the shaded region.



2. Consider the region bounded by  $y = \sqrt{e^x}$ ,  $y = 0$ ,  $x = 0$  and  $x = \ln(8)$ .

This region is rotated around the  $x$ -axis. Find the volume of the resulting solid.

3. The region contained between the  $x$ -axis and  $y = 3x - x^2 - 2$  is rotated around the  $y$ -axis. Find the volume of the resulting solid.

4. Find the arc length of the curve  $y = \frac{\sqrt{x^2 + 2}^3}{3}$  from  $x = 0$  to  $x = 1$ .

5. The graph of  $y = x^3$  for  $0 \leq x \leq 1$  is rotated around the  $x$ -axis. Find the area of the resulting surface.
6. A variable force moves an object from 0 to 5 on the number line (units in meters). At any point  $x$  between 0 and 5, the force is  $\frac{2x}{x^2 + 1}$  Newtons. Find the work done in moving the object from 0 to 5.