AP Calculus AB Name_____
2nd semester review
Calculator OK

Find the area enclosed by the lines and curves. You must show your set up, can solve using a calculator.

1. $y = x,\ y = \frac{1}{x^2},\ x = 2$

2. $x = 2y^2,\ x = 0,\ y = 3$

3. The base of a solid is the region enclosed between the graphs of $y = \sin x$ *and* $y = -\sin x$ from x=0 to $x = \pi$. Each cross section is perpendicular to the x-axis is a semi-circle with diameter connecting the two graphs. Find the volume of the solid.

4. Find the volume of the solid generated by revolving the region enclosed by the parabola $y^2 = 4x$ and the line y = x about:

a. the x-axis

b. the y-axis

c. the line x=4

d. the line y = 4

5. Approximate the area under the curve $y = x^2$ from x = 0 and x = 3 with six subintervals:

a. RRAM b. LRAM c. MRAM

6. Solve the initial value problem.

a. $\frac{dy}{dx} = 1 + x + \frac{x^2}{2}, \quad y(0) = 1$

b. $\frac{dy}{dt} = \frac{1}{t+4}, \quad y(-3) = 2$

7. $f'(x) = \sin^2 x$ *and* $f(1) = 3$, *find* $f(6)$

8. A violin made in 1785 by John Betts, one of England's finest violin makers, cost $250 in 1924 and sold for $7500 in 1988. Assuming a constant relative rate of appreciation, what was the rate?

*you should review slope field problems on page 336

Answers:

1. 1 2. 18 3. $\frac{\pi^2}{4}$ 4a. $\frac{32\pi}{3}$ b. $\frac{128\pi}{15}$ c. $\frac{64\pi}{5}$ d. $\frac{32\pi}{3}$

5a. 11.375 b. 6.875 c. 8.9375

6a. $y = \frac{x^3}{6} + \frac{x^2}{2} + x + 1$ b. $y = \ln(t+4) + 2$

7. 5.861 8. 5.3%