

# Warm up Problem

Let  $R$  be the region bounded by  $y = x^4$  and  $y = x$ . Set up an integral to find each of the following, then use a calculator to evaluate.

- 1) The area of  $R$ . **.3**
- 2) The length of the boundary of  $R$ . **3.014**
- 3) The volume if  $R$  is rotated about the  $x$ -axis. **.698**
- 4) The volume if  $R$  is rotated about the line  $y = 1$ . **1.187**
- 5) The volume of the solid with base  $R$  and cross-sections that are semicircles with diameter perpendicular to the  $x$ -axis **.044**

## Unit 8 Progress Check: MCQ Part A

- Only do 3-5, 13-18

## Unit 8 Progress Check: MCQ Part B

- Do them all

# Calculators Allowed

1. B

2. C

3. a.  $\frac{64\pi}{3}$

b.  $\pi \int_0^4 \left[ y^2 - \left( \frac{1}{64} y^4 \right)^2 \right] dy$

4. a. 1.385

b. 9.408

c.  $\frac{\pi}{8} \int_0^1 \left( e^x - (x-1)^2 \right)^2 dx$

5. a. 0.082

b.  $\int_{-0.715}^0 \sqrt{1 + (e^x)^2} + \sqrt{1 + (-2x)^2} dx$

6. a. 3.215

b. 8.997

c.  $\pi \int_0^{1.488} \left[ \left( 1 + (4 - 2x) \right)^2 - \left( 1 + \frac{x^3}{1 + x^2} \right)^2 \right] dx$

# No Calculators

1. D

2. a.  $\frac{1}{4}(1 - \sin x)^2$

b.  $\int_0^{\pi/2} \frac{1}{4}(1 - \sin x)^2 dx$