

### 3 VOLUME BY SLICES – Show your work on your own paper.

Draw a sketch of the figure. Use **calculus** to find the volume with the indicated base and slices. Show the integral used. All slices are perpendicular to the base.

- Base the area ENCLOSED by  $f(x) = 0.27e^{x-1} + 2$  and  $g(x) = -0.24x^2 - 0.35x + 3.8$ 
  - Squares
  - Rectangles of height 2
  - Semicircles
  - Right isosceles triangles
  - Equilateral triangles
  - Rectangles twice as tall as wide
- Base enclosed by the x and y axis and the line  $y = -2x + 4$ 
  - Squares
  - Rectangles of height 3
  - Semicircles
  - Right isosceles triangles
  - Equilateral triangles
- Base enclosed by the x axis, y-axis,  $f(x) = \cos \pi x + 2$  and the line  $x=2$ .
  - Squares
  - Rectangles of height 2
  - Semicircles
  - Right isosceles triangles
  - Equilateral triangles
- Base enclosed by the x and y axis and the line  $f(x) = 2\sin(\cos x) + 4$  and the line  $x = 6$ .
  - Squares
  - Rectangles of height 3
  - Semicircles
  - Right isosceles triangles
  - Equilateral triangles
- Find the area enclosed by  $f(x) = 2\sin(\cos x) + 4$  and  $g(x) = x^3 - 2x^2 - 2x + 7$ . Include a graph, integral(s) used and the answer to 3 decimal places.
- Find the area between  $f(x) = x^3$  and  $g(x) = x$  without a calculator. Include a graph, integral(s) used and the calculation that leads to your answer.

## Answers

1. In class!

2. -

a.  $\frac{32}{3}$

b. 12

c.  $\frac{4\pi}{3}$

d.  $\frac{16}{3}$

e.  $\frac{8\sqrt{3}}{3}$

3. In class!

4.

a. 101.185

b. 70.583

c.  $12.648\pi \approx 39.734$

d. 50.593

e. 43.814

5. 3.396

6.  $2 \int_0^1 x - x^3 dx = \frac{1}{2}$