1   PART I: Areas

1. *Find the area of the region bounded by $y = 4x$, $y = -4$, and $y = 12 - 2x$.*

2. *Find the area bounded by $y = 18 - 3x^2$ and $y = x^2 + 2$.*

3. *Set up an integral which gives the area of the region given by $y = \dfrac{1}{3}x^2 + 1$, $y = \dfrac{1}{2}x + \dfrac{5}{2}$, $y = 3$.*

2   PART II: Volumes by slicing

4. *Find the volume of a solid, whose base is a region in the xy plane bounded by $y = 9 - 9x^2$, $y = 9 + 9x$, and $y = 0$.*

- *When cross sections through it are squares perpendicular to x axis*

- *When cross sections through it are squares perpendicular to y axis*

5. *The base of a solid is the region in the xy plane bounded by the curves $y = 9 - 9x^2$, $y = 9 + 9x$, and $y = 0$. Find the volume if the cross sections are given by equilateral triangles.*

3   PART III: Volumes by revolution

6. *The region bounded by $y = 10 - 3x^2$, $x = 0$ and $x = 1$ is revolved about the following axes. In each case, set up an integral for the volume of the resulting object and calculate the volume.*

- $x = 0$

- $y = 0$

- $x = 2$

- $y = -5$

7. *The region bounded by $y = 3x - 2$, $y = \sqrt{x}$ and $y = 0$ is revolved about the following axes. In each case, set up an integral for the volume of the resulting object and calculate the volume.*

- $x = 0$

- $y = 0$

- $y = 10$

- $x = -1$