Surname _____ **First Name** _____ **Student #** _____

MAT1332A–Assignment 1

Total: 10 marks. **Due date: Sept 30, 3:00pm**

1. Find the area of the region bounded by the functions:

$$f(x) = \sqrt{x}, \quad g(x) = x^2.$$

2. Find the area of the region bounded by the functions:

$$f(x) = \frac{6}{1+x^2}, \quad g(x) = 3x^2.$$

3. Find the volume of the solid obtained by rotating the region Ω about the line $y = -1$, where Ω is the region bounded by $f(x) = \sqrt{x+2} - 1$, $g(x) = 0$, from $x = 2$ to $x = 6$.

4. Find the volume of the solid obtained by rotating the region Ω about the line $y-$axis, where Ω is the region bounded by $f(x) = \sqrt{x}$ and $g(x) = \frac{x}{4}$.

5. Evaluate $\displaystyle\int \frac{8x+4}{(x-1)(x^2+1)}\,dx$.