Name: ID #: Section #:

(**1**) [**5** Points]

(a) If $R = [-1, 1] \times [1, 4]$, use a Riemann Sum with $m = 2, n = 3$ to estimate the value of $\iint_R \frac{y^2}{1+x^2}\, dA$. Take the sample points to be the lower right corners.

(b) Find the exact value of the integral in part (a).

(c) What is the average value of $f(x, y) = \frac{y^2}{1+x^2}$ over the rectangle R in part (a)?

(**2**) [**5** points]

(i) **Sketch** the solid in the first octant bounded by the cylinder $z = 9 - y^2$ and the plane $x = 4$.

(ii) **Find the volume** of the solid in part (i).

Name: ID #: Section #:

(**1**) [**5** Points]

(a) If $R = [1, 4] \times [-1, 1]$, use a Riemann Sum with $m = 3, n = 2$ to estimate the value of $\iint_R \frac{x^2}{1+y^2} dA$. Take the sample points to be the upper left corners.

(b) Find the exact value of the integral in part (a).

(c) What is the average value of $f(x, y) = \frac{x^2}{1+y^2}$ over the rectangle R in part (a)?

(**2**) [**5** points]

(i) **Sketch** the solid in the first octant bounded by the cylinder $z = 4 - x^2$ and the plane $y = 5$.

(ii) **Find the volume** of the solid in part (i).