Quiz 7

Name: ————————————————   Section and/or TA: ——————————

   Answer all questions in a clear and concise manner. Unsupported answers will receive *no credit*.

1. (2 points) Solve the following integral by identifying it with the volume of a solid:

$$\iint_R 2\pi \, dA, \quad \text{where } R = \{(x,y) \mid -2 \le x \le 2, 0 \le y \le 3\}$$

> **Solution:** The integral corresponds to the volume of a rectangular solid with base R and height 2π. Since the area of the region R is 12 units squared, the value of the integral is $2\pi \cdot 12 = 24\pi$.

2. (3 points) Let $f(x,y) = x^2 + 4y$, and let D be the region bounded above by the semicircle $y = \sqrt{9 - x^2}$ and bounded below by the x-axis. **Set up** an iterated integral for

$$\iint_D f(x,y) \, dA$$

Do not solve the integral.

> **Solution:** The region D is of **type I** with $-3 \le x \le 3$ and $0 \le y \le \sqrt{9 - x^2}$. Hence
>
> $$\iint f(x,y) \, dA = \int_{-3}^{3} \int_0^{\sqrt{9-x^2}} x^2 + 4y \; dydx$$