

15.1, number 17: **Compute** $\int \int_R (6y^2 - 2x) dA$, where R is the region described by $0 \leq x \leq 1$ and $0 \leq y \leq 2$.

Answer: I fill in R using vertical lines. (See the next page.) For each fixed x , with $0 \leq x \leq 1$, y goes from 0 to 2.

$$\begin{aligned} \int \int_R (6y^2 - 2x) dA &= \int_0^1 \int_0^2 (6y^2 - 2x) dy dx \\ &= \int_0^1 (2y^3 - 2xy) \Big|_0^2 dx \\ &= \int_0^1 (16 - 4x) dx \\ &= (16x - 2x^2) \Big|_0^1 \\ &= 16 - 2 = \boxed{14} \end{aligned}$$

Picture 15.1 Number 17

