MATH116: QUIZ V

Name:
Student Number:
Section: 2
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Question
Find the area of the region between the curves $y = 12x$ and $y = 4x^2$ by using the definition of the area of a region in terms of a double integral.

Solution

$$A(R) = \int_0^3 \int_{4x^2}^{12x} dy\, dx = \int_0^3 (12x - 4x^2)dx = 6x^2 - \frac{4}{3}x^3|_0^3 = 18$$

or

$$A(R) = \int_0^{36} \int_{y/12}^{\sqrt{y}/2} dxdy = \int_0^{36} (\frac{1}{2}\sqrt{y} - \frac{y}{12})dy = (\frac{1}{3}y^{3/2} - \frac{y^2}{24})|_0^{36} = 18$$