

Question#18928

Use a definite integral to find the area under the curve between the given x-values.

$$f(x) = x - 1 + x^5 \text{ from } x = 1 \text{ to } x = 2$$

Solution:

$$V = \int_{x_1}^{x_2} f(x) dx = \int_1^2 (x - 1 + x^5) dx = \left. \frac{1}{2}x^2 - x + \frac{1}{6}x^6 \right|_1^2 = \left(\frac{1}{2}2^2 - 2 + \frac{1}{6}2^6 \right) - \left(\frac{1}{2} - 1 + 1 \right) = 10\frac{1}{6}$$

Answer: $10\frac{1}{6}$ square units.