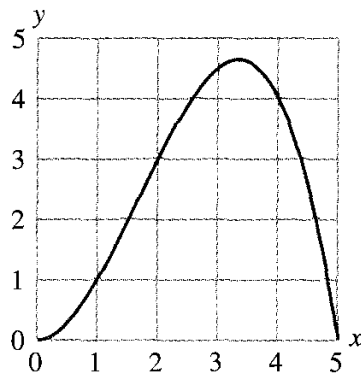


Limits and Motion: The Area Problem

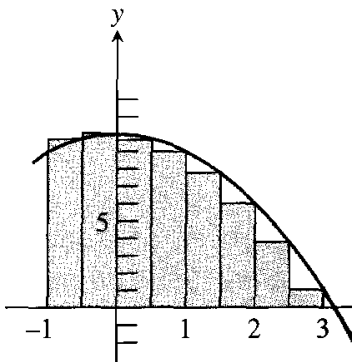
6-4-08

1. Explain how to represent the problem situation as an area question and then solve the problem.
A city has a population density of 650 people per square mile in an area of 20 square miles. What is the population of the city?

2. Estimate the area of the region above the x-axis and under the graph of the function from $x=0$ to $x=5$.



3. Use the 8 rectangles shown to approximate the area of the region below the graph $f(x) = 10 - x^2$ over the interval $[-1, 3]$.



Limits and Motion: The Area Problem

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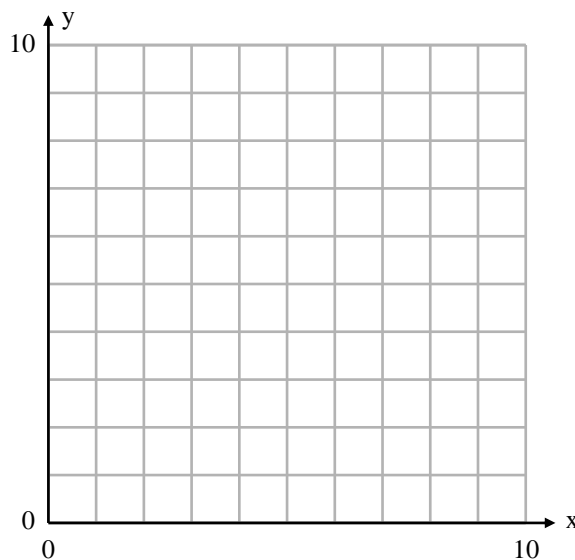
4. Partition the given interval into the indicated number of subintervals.

$$[1,5]; 8$$

5. Complete the following for the given.

- Draw the graph of the function for x in the specified interval. Verify that the function is nonnegative in that interval.
- On the graph draw and shade the approximating rectangles for the RRAM using the specified partition. Compute the RRAM area estimate without a calculator.
- Repeat b. using LRAM.
- Average the RRAM and LRAM approximations from b. and c. to find an average estimate of the area.

$$f(x) = x^3; [0,3]; 3 \text{ subintervals}$$



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6. Find the definite integral by computing an area.

$$\int_1^7 0.5 dx$$