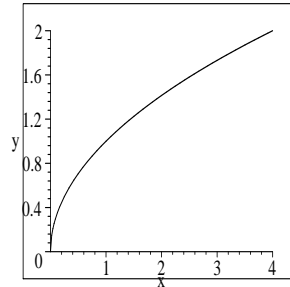


# Quiz 14

MATH 139-01 and -02  
Tuesday, November 4, 2003

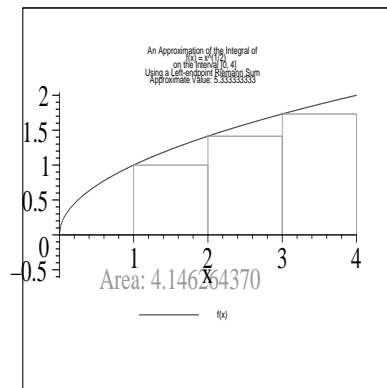
Be sure to **show your work**. Unsupported answers receive no credit.

1. Draw grid lines on the graph below and use them to estimate  $\int_0^4 f(x)dx$  with  $n = 4$ .

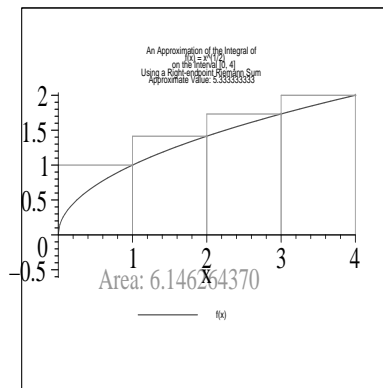


$$y = f(x)$$

**Solution:** I used the left- and right-hand approximations below and averaged them.



Left-hand Sum



Right-hand Sum

2. Consider  $\int_0^3 4x dx$ .

- (a) Use your calculator to determine  $\int_0^3 4x dx$ .

**Solution:** MAPLE gives 18 for this.

- (b) Use a geometric formula to determine  $\int_0^3 4x dx$ .

**Solution:** We have a triangle with base 3 and height 12, so the area is  $\frac{1}{2}(3)(12) = 18$ .

3. Evaluate  $\sum_{i=1}^5 i^2$ .

**Solution:** This is just  $1^2 + 2^2 + 3^2 + 4^2 + 5^2 = 55$ .