

Solutions for Calculus Vol 1: One variable
calculus, with an introduction to Linear Algebra
(2nd Edition) by Tom M. Apostol

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0.1 Introduction

0.1.1 1.4 Exercises

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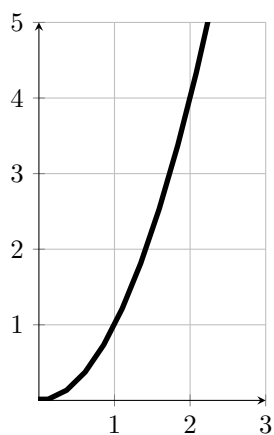
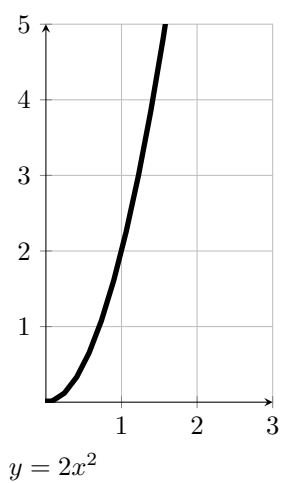


Figure 1.3: $y = x^2$

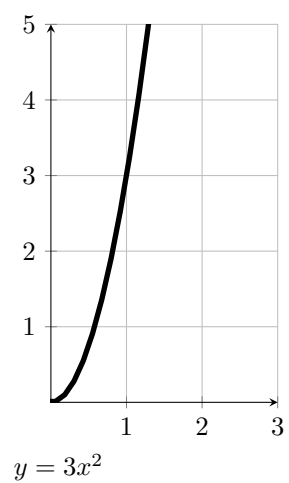
a) Modify the region in Figure 1.3 by assuming that the ordinate at each x is $2x^2$ instead of x^2 .

Draw the new figure.

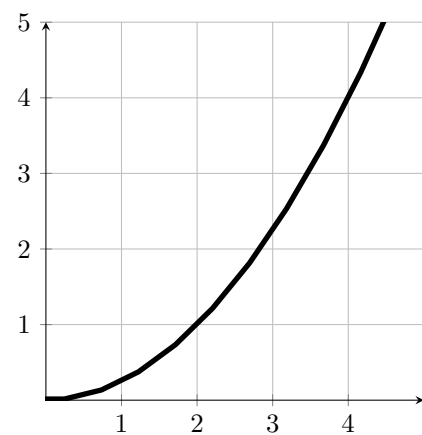


Check through the principal steps in the forgoing section and find what effect this has on the calculation of the area. Do the same if the ordinate at each x

b) $3x^2$



c) $\frac{1}{4}x^2$



$$y = \frac{1}{4}x^2$$

- d) $2x^2 + 1$
- e) $ax^2 + c$

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Modify the region in Figure 1.3 by assuming that the ordinate at each x is x^3 instead of x^2 .

Draw the new figure.

a) Use a construction similar to that illustrated in Figure 1.5 and show that the outer and inner sums S_n and s_n are given by

$$S_n = \frac{b^4}{n^4}(1^3 + 2^3 + \dots + n^3), \quad s_n = \frac{b^4}{n^4}[1^3 + 2^3 + \dots + (n-1)^3]$$

b)