

Section 5-5 : Area Problem

For problems 1 – 5 estimate the area of the region between the function and the x-axis on the given interval using $n = 6$ and using,

- (a) the right end points of the subintervals for the height of the rectangles,
- (b) the left end points of the subintervals for the height of the rectangles and,
- (c) the midpoints of the subintervals for the height of the rectangles.

1. $f(x) = 15 + 4x - x^3$ on $[1, 3]$

2. $g(x) = -3x^2 + 2x - 1$ on $[-4, 0]$

3. $h(x) = 8\ln(x) - x$ on $[2, 6]$

4. $f(x) = \sin^2\left(\frac{x}{2}\right)$ on $[0, 3]$

5. $g(x) = \sin(x)\cos(x) - 1$ on $[-2, 1]$

For problems 6 – 8 estimate the net area between the function and the x-axis on the given interval using $n = 8$ and the midpoints of the subintervals for the height of the rectangles. Without looking at a graph of the function on the interval does it appear that more of the area is above or below the x-axis?

6. $h(x) = 8x - \sqrt{x+4}$ on $[-3, 2]$

7. $g(x) = 5 + x - x^2$ on $[0, 4]$

8. $f(x) = xe^{-x^2}$ on $[-1, 1]$

