

# Midpoint and Trapezoid Rule

Estimate the area using the Midpoint/Trapezoidal rule between the graph of the function and the  $x$ -axis for problems 1 - 8.

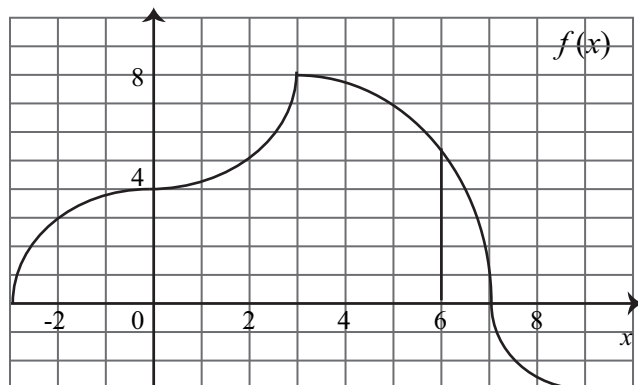


FIG - 1

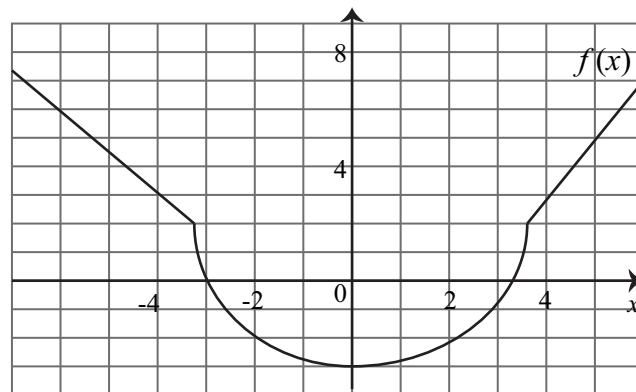


FIG - 2

- Using Midpoint(3) for  $f(x) = x^2 - 2x$  in  $[0, 3]$ .
- Using Trapezoid(3) for  $f(x) = x^2 - 2x$  in  $[0, 3]$ .
- Using Midpoint(3) for  $f(x) = \sin(2x)$  on  $(0, \frac{3\pi}{4})$ .
- Using Trapezoid(2) for  $f(x) = \cos(4x)$  on  $(0, \frac{\pi}{8})$ .
- Shade and estimate Midpoint(4) in Fig-1 for  $f(x)$  in  $[-3, 9]$ .
- Shade and estimate Trapezoid(5) in Fig-2 for  $f(x)$  in  $[-6, 4]$ .
- Using Midpoint sum for  $f(x)$  in  $[-1, 10]$ 

$x$	-1	3	4	6	10
$f(x)$	5	-2	3	5	7
- Using Trapezoid rule for  $f(x)$  in  $[3, 10]$ 

$x$	-1	3	4	6	10
$f(x)$	5	-2	3	5	7
- For  $f(x) = xe^{-x}$  on  $[2, 8]$ , is Midpoint sum gives an over estimate?
- For  $f(x) = x^2 + \ln(x^2)$  on  $[0, 1]$ , is Trapezoid rule an over estimate?