

## Area by Rectangular Approximation Method

Date \_\_\_\_\_ Period \_\_\_\_\_

For each problem, approximate the area under the curve over the given interval using 3 left endpoint rectangles.

1)  $y = -x^2 - 2x + 11$ ;  $[-3, 0]$

x	y
-3	8
-2	11
-1	12
0	11

$1(8+11+12)$   
 $31$

2)  $y = -\frac{3}{x}$ ;  $[-\frac{7}{2}, -2]$

x	y
$-\frac{7}{2}$	$\frac{6}{7}$
-3	1
$-\frac{5}{2}$	$\frac{6}{5}$
-2	$\frac{3}{2}$

$\frac{1}{2} \left( \frac{6}{7} + 1 + \frac{6}{5} \right) = \frac{107}{70}$   
 $= 1.52857$

For each problem, approximate the area under the curve over the given interval using 4 left endpoint rectangles.

3)  $y = -\frac{5}{x}$ ;  $[-4, -2]$

x	y
-4	$\frac{5}{4}$
$-\frac{7}{2}$	$\frac{10}{7}$
-3	$\frac{5}{3}$
$-\frac{5}{2}$	2
-2	$\frac{5}{2}$

$\frac{533}{168} = 3.17261$

4)  $y = -\frac{x^2}{2} + x + 5$ ;  $[-2, 2]$

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For each problem, approximate the area under the curve over the given interval using 3 right endpoint rectangles.

5)  $y = -\frac{x^2}{2} - x + 5$ ;  $[-\frac{1}{2}, 1]$

$$\frac{103}{16} = 6.4375$$

6)  $y = -x^2 + 13$ ;  $[-\frac{5}{2}, -1]$

$$\frac{127}{8} = 15.875$$

For each problem, approximate the area under the curve over the given interval using 5 right endpoint rectangles.

7)  $y = x^2 - 2x + 3$ ;  $[-\frac{3}{2}, 1]$

$$\frac{35}{4} = 8.75$$

8)  $y = -\frac{x^2}{2} + 6$ ;  $[-\frac{5}{2}, 0]$

$$\frac{105}{8} = 13.125$$

For each problem, approximate the area under the curve over the given interval using 4 midpoint rectangles.

9)  $y = \frac{x^2}{2} + x + 1; [-5, -3]$

$$\frac{165}{16} = 10.3125$$

10)  $y = x^2 + 2x + 4; [-4, -2]$

$$\frac{117}{8} = 14.625$$

For each problem, approximate the area under the curve over the given interval using 5 midpoint rectangles.

11)  $y = \frac{4}{x}; [2, \frac{9}{2}]$

$$3.23546$$

12)  $y = \frac{x^2}{2} - x + 2; [-\frac{1}{2}, 2]$

$$\frac{285}{64} = 4.453125$$

For each problem, approximate the area under the curve over the given interval using 4 inscribed rectangles.

13)  $y = -x^2 - 2x + 11; [-2, 2]$

$$\begin{aligned} & [-2, -1] [-1, 0] [0, 1] [1, 2] \\ & 1(11 + 11 + 8 + 3) \\ & 33 \end{aligned}$$

14)  $y = \frac{3}{x}; [1, 3]$

$$\begin{aligned} & [1, \frac{3}{2}] [\frac{3}{2}, 2] [2, \frac{5}{2}] [\frac{5}{2}, 3] \\ & \frac{1}{2}(2 + \frac{3}{2} + \frac{6}{5} + 1) \\ & \frac{57}{20} = 2.85 \end{aligned}$$

For each problem, approximate the area under the curve over the given interval using 4 circumscribed rectangles.

15)  $y = x^2 + 2x + 4; [-3, -1]$

$$\begin{aligned} & \frac{39}{4} = 9.75 \\ & \frac{1}{2}(7 + 5.25 + 4 + 3.25) \end{aligned}$$

16)  $y = -\frac{4}{x}; [-6, -2]$

$$\begin{aligned} & [-6, -5] [-5, -4] [-4, -3] [-3, -2] \\ & 1(\frac{4}{5} + 1 + \frac{4}{3} + 2) \\ & \frac{77}{15} = 5.13333 \end{aligned}$$