

Mathematics Practice Worksheet

Integration

Area between two curves 2 of 3

Student Name:

Date:

Find the area between the two curves using integration and verify your answer using GDC.

1	$y = -\frac{x^2}{2} - 2x + 4, \quad y = -x$
2	$y = \sin 2x, x \text{ axis}$ between $x = 0$ and $x = \pi$
3	$y = -\frac{x^2}{2} + 5, \quad y = \frac{x}{2} + 4$
4	$y = x^2 - x - 2, x \text{ - axis}$ between lines $x = -2$ and $x = 4$

$$5 \quad y = \frac{x^3}{2} + \frac{x^2}{2} - 2x, \quad y = x$$

$$6 \quad y = \frac{x^3}{2} + \frac{x^2}{2} - 2x, \quad y = \frac{x^2}{2}$$

$$7 \quad y = -x^3 - x^2 + 4x, \quad y = -2x$$

$$8 \quad y = -2x^2 - 8x - 4, \quad y = -2x^2 - 12x - 12 \quad \text{between the lines } x = -4 \text{ and } x = -1$$

9 $y = x^2 + 8x + 14,$ $y = \frac{x^2}{2} + 2x - 2$ between the lines $x = -6$ and $x = -2$

10 $y = -x^3 + 7x^2 - 11x,$ $y = -x^2 + 4x$

11 $y = \sqrt{x}, y = 3\sqrt{x}$ between the lines $x = 0$ and $x = 4$

12 $y = -\frac{x^2}{2} + x + \frac{7}{2}, y = \frac{x^2}{2} + x - \frac{1}{2}$ between the lines $x = -2$ and $x = 3$

13 $y^2 = x$ and $y = x - 2$

14 $y = x^2 - 6x + 9, y = -2x^2 + 12x - 15$

15 $y = \frac{x^3}{2} - 3x, y = \frac{x^2}{2}$

16 $y = -2x^3 - 3x^2 + 4x, y = -x^2$

17 $y = -x^3 - x^2 + 5x, \quad y = -x$

18 $y = -\frac{2}{x^2}, \quad y = 2$ between the lines $x = 2$ and $x = 3$

19 $y = -\frac{x^2}{2} - x + \frac{9}{2}, \quad y = \frac{x^2}{2} - x - \frac{9}{2}$

20 $y = \sin 4x, x - axis$ between the lines $x = 0$ and $x = \frac{\pi}{4}$

Answers

1	$y = -\frac{x^2}{2} - 2x + 4, \quad y = -x$	Area = 18 square units.
2	$y = \sin 2x, \quad x \text{ axis}$ between $x = 0$ and $x = \pi$	Area = 2 square units.
3	$y = -\frac{x^2}{2} + 5, \quad y = \frac{x}{2} + 4$	Area = $\frac{9}{4} = 2.25$ square units.
4	$y = x^2 - x - 2, \quad x - \text{axis}$ between lines $x = -2$ and $x = 4$	Area = 15 square units.
5	$y = \frac{x^3}{2} + \frac{x^2}{2} - 2x, \quad y = x$	Area = $\frac{253}{24} = 10.5$ square units.
6	$y = \frac{x^3}{2} + \frac{x^2}{2} - 2x, \quad y = \frac{x^2}{2}$	Area = 4 square units.
7	$y = -x^3 - x^2 + 4x, \quad y = -2x$	Area = $\frac{253}{12} = 21.1$ square units.
8	$y = -2x^2 - 8x - 4, \quad y = -2x^2 - 12x - 12$ between the lines $x = -4$ and $x = -1$	Area = 10 square units.
9	$y = x^2 + 8x + 14, \quad y = \frac{x^2}{2} + 2x - 2$ between the lines $x = -6$ and $x = -2$	Area = 8 square units.
10	$y = -x^3 + 7x^2 - 11x, \quad y = -x^2 + 4x$	Area = $\frac{253}{12} = 21.1$ square units.

11	$y = \sqrt{x}, y = 3\sqrt{x}$ between the lines $x = 0$ and $x = 4$	$\text{Area} = \frac{32}{3} = 10.7$ square units.
12	$y = -\frac{x^2}{2} + x + \frac{7}{2}, y = \frac{x^2}{2} + x - \frac{1}{2}$ between the lines $x = -2$ and $x = 3$	$\text{Area} = 13$ square units.
13	$y^2 = x$ and $y = x - 2$	$\text{Area} = \frac{9}{2} = 4.5$ square units.
14	$y = x^2 - 6x + 9, y = -2x^2 + 12x - 15$	$\text{Area} = 4$ square units.
15	$y = \frac{x^3}{2} - 3x, y = \frac{x^2}{2}$	$\text{Area} = \frac{25}{24} = 10.5$ square units.
16	$y = -2x^3 - 3x^2 + 4x, y = -x^2$	$\text{Area} = \frac{37}{6} = 6.17$ square units.
17	$y = -x^3 - x^2 + 5x, y = -x$	$\text{Area} = \frac{125}{12} = 10.4$ square units.
18	$y = -\frac{2}{x^2}, y = 2$ between the lines $x = 2$ and $x = 3$	$\text{Area} = \frac{7}{3} = 2.33$ square units.
19	$y = -\frac{x^2}{2} - x + \frac{9}{2}, y = \frac{x^2}{2} - x - \frac{9}{2}$	$\text{Area} = 36$ square units.
20	$y = \sin 4x, x - \text{axis}$ between the lines $x = 0$ and $x = \frac{\pi}{4}$	$\text{Area} = \frac{1}{2} = 0.5$ square units.