201-SH3-AB - Exercises #7: Areas Between Curves

Find the area of the region enclosed by the given curves.

(1) $x = -2$, $x = 3$, $f(x) = -x^2 + 4$, $y = 0$

(2) $x = -3$, $x = 1$, $f(x) = x^3 + 1$, $y = 0$

(3) $y = x^5 - x$, $y = 0$, $0 \le x \le 2$

(4) $y = x^4 - x^3$, $y = 0$, $0 \le x \le 2$

(5) $y = x^3 + x^2$, $y = 0$, $-1 \le x \le 2$

(6) $y = x^4 + x$, $y = 0$, $-1 \le x \le 2$

(7) $y = -x^2 - x$, $y = 0$, $-1 \le x \le 2$

(8) $y = x^2 + 2$, $y = 0$, $-1 \le x \le 0$

(9) $y = 4 - x^2$, $y = 0$, $-3 \le x \le 1$

(10) $y = x^3 - x^2 + x - 1$, $y = 0$, $0 \le x \le 2$

(11) $y = x^3 + x^2 + x + 1$, $y = 0$, $-3 \le x \le 1$

(12) $y = x^3 + x^2 - 2x$, $y = 0$, $-2 \le x \le 1$

(13) $y = x^3 + 2x$, $y = 0$, $-1 \le x \le 2$

(14) $y = x^3 - x^2$, $y = 0$, $-1 \le x \le 1$

(15) $f(x) = x^3 - 1$ and the x-axis, from $x = 0$ to $x = 2$

(16) $y = x^2 - 18$ and $y = x - 6$

(17) $y = 2x$, $y = x^2 - 3$, $x = -2$ and $x = 1$

(18) $y = 10 - 3x$ and $y = x^2 - 30$

(19) $y = x$ and $y = x^5$

(20) $f(x) = -x^2 + 4x + 2$ and $g(x) = x + 2$

(21) $f(x) = x^3 - 2x + 1$, $g(x) = -2x$ and $x = 1$

(22) $f(x) = x^2 - 4x + 3$ and $g(x) = 3 + 4x - x^2$

(23) $f(x) = 2x^2 + 2x$, $g(x) = x^2 - x + 4$, $x = -2$ and $x = 2$

(24) $f(x) = x^3 - x^2 + 6$, $g(x) = x^2 + 3x + 6$, $x = -1$, $x = 2$

(25) $f(x) = x^4 - 16$, $g(x) = 4x^2 - 16$, $x = 0$ and $x = 3$

(26) $f(x) = -x^2 + 4x$, $g(x) = x^2 - 6$, $x = -1$ and $x = 2$

(27) $f(x) = x^2$, $g(x) = 2x + 3$, $x = 0$ and $x = 4$

(28) $f(x) = 2x^2 - 2x$, $g(x) = 2x + 16$, $x = -3$ and $x = 0$

(29) $f(x) = 2x^2$, $g(x) = 4x + 16$, $x = -1$ and $x = 2$

(30) $f(x) = x^2 - x$, $g(x) = x + 8$, $x = 0$ and $x = 5$

ANSWERS:

(1) 13

(2) 20

(3) $\frac{28}{3}$

(4) $\frac{5}{2}$

(5) $\frac{27}{4}$

(6) $\frac{87}{10}$

(7) $\frac{29}{6}$

(8) $\frac{7}{3}$

(9) $\frac{34}{3}$

(10) $\frac{5}{2}$

(11) 16

(12) $\frac{37}{12}$

(13) $\frac{37}{4}$

(14) $\frac{2}{3}$

(15) $\frac{7}{2}$

(16) $\frac{343}{6}$

(17) $\frac{23}{3}$

(18) $\frac{2197}{6}$

(19) $\frac{2}{3}$

(20) $\frac{9}{2}$

(21) 2

(22) $\frac{64}{3}$

(23) $\frac{49}{3}$

(24) $\frac{95}{12}$

(25) $\frac{317}{15}$

(26) 18

(27) $\frac{34}{3}$

(28) $\frac{76}{3}$

(29) 48

(30) 30