Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 1

Exercise 1

Compute $\int_D (3\,x)\,dx\,dy$ for $D=\{0 \le -x+7\,y \le 4,\ 0 \le -3\,x+y \le 6\}$

1) -5.12

2) -3.72

3) -4.52

4) -3.42

5) -4.82

Exercise 2

Compute $\int_D (x\,y)\,dx\,dy$ for $D=\left\{5 \le x^7\,y^2 \le 6,\ 2 \le x^{24}\,y^7 \le 8,\ x>0,\ y>0\right\}$

1) -0.2

2) -0.3

3) 5.41449×10^{-18}

4) $-1.$

5) -0.3

Exercise 3

Compute the volume of $D=\left\{x^2+y^2+z^2 \le 4,\ z \ge \sqrt{x^2+y^2}\right\}$

1) 4.90747

2) -0.490747

3) -4.90747

4) -4.90747

5) 1.47224

Exercise 4

Compute the volume of the domain limited by the plane $5\,x+5\,z==4$ and the paraboloid $z==7\,x^2+7\,y^2$.

1) 0.395233

2) 0.121221

3) 0.186268

4) 0.156725

5) 0.112974

Exercise 5

Compute $\int_D (2\,y\,z^2)\,dx\,dy\,dz$ for D=

$\left\{2\,x\,z^3 \le y^7 \le 9\,x\,z^3,\ 6\,y^9 \le x\,z^2 \le 9\,y^9,\ 8\,x^9\,y^5 \le z \le 12\,x^9\,y^5,\ x > 0,\ y > 0,\ z > 0\right\}$

1) -0.999997

2) $-2.$

3) 3.15221×10^{-6}

4) -1.6

5) -1.7

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 2

Exercise 1

Compute $\int_D (2x + y)\,dx\,dy$ for $D = \{0 \le -2x + 7y \le 2,\ 0 \le x - 3y \le 5\}$

1) 141.

2) 470.

3) −282.

4) 47.

5) 1269.

Exercise 2

Compute $\int_D (x + 3y)\,dx\,dy$ for $D = \left\{5x^7y^2 \le 1 \le 11x^7y^2,\ 4x^{10}y^3 \le 1 \le 10x^{10}y^3,\ x > 0,\ y > 0\right\}$

1) -3.10125×10^8

2) -3.10125×10^8

3) -1.77214×10^8

4) 4.43036×10^8

5) 5.31643×10^8

Exercise 3

Compute the volume of $D = \left\{x^2 + y^2 + z^2 \le 1,\ z \ge 6\left(x^2 + y^2\right)\right\}$

1) 1.84116

2) −0.158843

3) −0.658843

4) −0.658843

5) 0.241157

Exercise 4

Compute the volume of the domain limited by the plane $4x + 2z = 6$ and the paraboloid $z = 4x^2 + 4y^2$.

1) 9.06746

2) 2.81022

3) 4.14788

4) 16.6321

5) 2.71811

Exercise 5

Compute $\int_D (x\, z^3)\, dx\, dy\, dz$ for $D=\left\{9\, x^2 \le y^7\, z \le 17\, x^2,\ x^3 \le y^7\, z^8 \le 4\, x^3,\ 8\, y^8 \le z^7 \le 14\, y^8,\ x>0,\ y>0,\ z>0\right\}$

1) 1.79796×10^{-10}

2) -1.1

3) -1.1

4) 0.7

5) -1.5

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 3

Exercise 1

Compute $\int_D (4\,x)\,dxdy$ for $D=\{0 \le 5\,x+8\,y \le 9,\ 0 \le -4\,x+6\,y \le 3\}$

1) 1.92144

2) 0.421436

3) 1.72144

4) −0.878564

5) −0.478564

Exercise 2

Compute $\int_D (3\,x+3\,y)\,dxdy$ for $D=\left\{7 \le x^3\,y^5 \le 12,\ 7 \le x\,y^2 \le 10,\ x>0,\ y>0\right\}$

1) 8.73214

2) 0.970238

3) 12.6131

4) 4.85119

5) 2.91071

Exercise 3

Compute the volume of $D=\left\{x^2+y^2+z^2 \le 196,\ z \ge 2\sqrt{x^2+y^2}\right\}$

1) −364.037

2) 242.692

3) 1395.48

4) 606.729

5) 1577.5

Exercise 4

Compute the volume of the domain limited by the plane $8\,x+5\,z==5$ and the paraboloid $z==8\,x^2+8\,y^2$.

1) 0.418924

2) 0.229022

3) 0.160911

4) 0.272878

5) 1.09246

Exercise 5

Compute $\int_D (y^4)\,dx\,dy\,dz$ for $D=\left\{8\,z^4 \le x^5\,y^8 \le 12\,z^4,\ 7 \le x^6\,y^6\,z^3 \le 15,\ 2 \le y^9\,z \le 10,\ x>0,\ y>0,\ z>0\right\}$

1) -0.296043

2) -0.896043

3) 1.30396

4) 1.00396

5) 0.00395719

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 4

Exercise 1

Compute $\int_D (x + y)\,dx\,dy$ for $D = \{0 \le 3x + 7y \le 7,\ 0 \le -x - 4y \le 3\}$

1) 13.86

2) 20.79

3) −4.158

4) −4.158

5) 16.632

Exercise 2

Compute $\int_D (x y^3)\,dx\,dy$ for $D = \{8xy \le 1 \le 11xy,\ 6 \le x^4 y^3 \le 14,\ x > 0,\ y > 0\}$

1) 2.

2) 1.8

3) 1.01221×10^{-12}

4) 1.8

5) 0.7

Exercise 3

Compute the volume of $D = \left\{x^2 + y^2 + z^2 \le 144,\ z \ge 3\sqrt{x^2 + y^2}\right\}$

1) 130.005

2) 538.591

3) 557.163

4) 111.433

5) 185.721

Exercise 4

Compute the volume of the domain limited by the plane $3x + 2z == 8$ and the paraboloid $z == 2x^2 + 2y^2$.

1) 14.3956

2) 34.4227

3) 0.211968

4) 2.65019

5) 10.4633

Exercise 5

Compute $\int_D (2\,z)\,dx\,dy\,dz$ for D=

$\left\{2\,z \le x^3\,y^7 \le 4\,z,\ 7\,x^4\,z^2 \le y^6 \le 11\,x^4\,z^2,\ 9\,x^6\,y^7 \le z^3 \le 12\,x^6\,y^7,\ x > 0,\ y > 0,\ z > 0\right\}$

1) 0.0161798

2) 1.91618

3) 0.61618

4) -0.38382

5) -1.18382

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 5

Exercise 1

Compute $\int_D (3x + y)\,dx\,dy$ for $D = \{0 \le 4x - y \le 6,\ 0 \le -2x + y \le 9\}$

1) 1192.73

2) −62.775

3) 0.

4) 627.75

5) 1255.5

Exercise 2

Compute $\int_D (y^3)\,dx\,dy$ for $D = \left\{7x^3 y \le 1 \le 10x^3 y,\ 6 \le x^4 y \le 9,\ x > 0,\ y > 0\right\}$

1) 1.1

2) −0.5

3) 3.4615×10^{-24}

4) −1.1

5) 0.8

Exercise 3

Compute the volume of $D = \left\{x^2 + y^2 + z^2 \le 144,\ z \ge 9\sqrt{x^2 + y^2}\right\}$

1) 42.0574

2) −2.21355

3) 4.42709

4) 48.698

5) 22.1355

Exercise 4

Compute the volume of the domain limited by the plane $7x + 4z == 1$ and the paraboloid $z == 9x^2 + 9y^2$.

1) 0.076145

2) 0.0590706

3) 0.0195951

4) 0.0222472

5) 0.0324898

Exercise 5

Compute $\int_D (y + 2z)\,dx\,dy\,dz$ for D=

$\left\{5yz^2 \le x^4 \le 9yz^2,\ 6z^4 \le xy^2 \le 12z^4,\ 9 \le x^9 y z^9 \le 18,\ x > 0,\ y > 0,\ z > 0\right\}$

1) 0.00986614

2) 1.80987

3) -1.59013

4) -0.690134

5) 1.10987

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 6

Exercise 1

Compute $\int_D (2x + 2y)\,dx\,dy$ for $D=\{0 \le -5x + 8y \le 8,\ 0 \le 2x - 5y \le 5\}$

1) -59.7531

2) -60.0531

3) -60.5531

4) -61.5531

5) -59.6531

Exercise 2

Compute $\int_D (y^2)\,dx\,dy$ for $D=\left\{6x^6 \le y^7 \le 7x^6,\ 2x \le y \le 11x,\ x > 0,\ y > 0\right\}$

1) 0.4

2) 1.7

3) 3.29316×10^{-7}

4) -1.8

5) -1.8

Exercise 3

Compute the volume of $D=\left\{x^2 + y^2 + z^2 \le 100,\ z \ge 2\left(x^2 + y^2\right)\right\}$

1) -68.9479

2) 76.6087

3) -38.3044

4) 38.3044

5) 168.539

Exercise 4

Compute the volume of the domain limited by the plane $3x + 5z == 6$ and the paraboloid $z == 7x^2 + 7y^2$.

1) 1.0553

2) 0.615906

3) 0.330097

4) 1.57653

5) 0.148757

Exercise 5

Compute $\int_D (x^2 + z)\,dx\,dy\,dz$ for D=

$\left\{7\,x^5 \le y^8\,z^2 \le 8\,x^5,\ x^5 \le y^5\,z^9 \le 4\,x^5,\ 4\,y^6 \le x^7\,z \le 11\,y^6,\ x > 0,\ y > 0,\ z > 0\right\}$

1) -1.65958

2) 1.94042

3) 0.0404182

4) -0.959582

5) -0.859582

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 7

Exercise 1

Compute $\int_D (x + 3y)\,dx\,dy$ for $D = \{0 \le x + 4y \le 9,\ 0 \le 7x \le 1\}$

1) 2.39923

2) 1.09056

3) −0.654337

4) 1.19962

5) 2.39923

Exercise 2

Compute $\int_D (x + 3y)\,dx\,dy$ for $D = \left\{2y^7 \le x^{23} \le 6y^7,\ 8y^3 \le x^{10} \le 11y^3,\ x > 0,\ y > 0\right\}$

1) 1.37519×10^{45}

2) 4.58395×10^{45}

3) 1.05431×10^{46}

4) 8.70951×10^{45}

5) 8.70951×10^{45}

Exercise 3

Compute the volume of $D = \left\{x^2 + y^2 + z^2 \le 49,\ z \ge 12\sqrt{x^2 + y^2}\right\}$

1) 4.9629

2) 6.45177

3) 2.48145

4) 3.22588

5) 1.98516

Exercise 4

Compute the volume of the domain limited by the plane $7x + 8z == 3$ and the paraboloid $z == 10x^2 + 10y^2$.

1) 0.119141

2) 0.0244018

3) 0.0446663

4) 0.091841

5) 0.0637487

Exercise 5

Compute $\int_D (x^3 y^2)\, dx\, dy\, dz$ for D=

$\{8 \le x\, y^4\, z^7 \le 13,\ 2\, y\, z^3 \le 1 \le 3\, y\, z^3,\ 9\, x^9\, y^3\, z^6 \le 1 \le 14\, x^9\, y^3\, z^6,\ x > 0,\ y > 0,\ z > 0\}$

1) 0.78102

2) 1.28102

3) 0.98102

4) −0.41898

5) 1.58102

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 8

Exercise 1

Compute $\int_D (3x + 3y)\,dx\,dy$ for $D=\{0 \le 4x + 2y \le 6,\ 0 \le -5x + y \le 6\}$

1) 17.1918

2) 13.2245

3) 7.93469

4) −6.61224

5) 25.1265

Exercise 2

Compute $\int_D (2x^3)\,dx\,dy$ for $D=\left\{5 \le x^9 y^4 \le 8,\ 4 \le x^{11} y^5 \le 10,\ x > 0,\ y > 0\right\}$

1) 255.859

2) 460.547

3) 690.82

4) −127.93

5) 51.1718

Exercise 3

Compute the volume of $D=\left\{x^2 + y^2 + z^2 \le 144,\ z \ge 11\sqrt{x^2 + y^2}\right\}$

1) 32.6985

2) 7.43148

3) 31.2122

4) −2.97259

5) 14.863

Exercise 4

Compute the volume of the domain limited by the plane $7x + 10z == 8$ and the paraboloid $z == 10x^2 + 10y^2$.

1) 0.103633

2) 0.490337

3) 0.09513

4) 0.0987507

5) 0.244306

Exercise 5

Compute $\int_D (x^3 z)\,dx\,dy\,dz$ for $D=\left\{z^5 \le x^4 y^2 \le 3 z^5,\ 8 \le x y^2 z \le 11,\ 3 z^8 \le x^2 y^9 \le 4 z^8,\ x > 0,\ y > 0,\ z > 0\right\}$

1) -0.438138

2) 0.561862

3) -0.138138

4) 0.061862

5) 1.66186

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 9

Exercise 1

Compute $\int_D (4\,y)\,dx\,dy$ for $D=\{0 \le -6\,x+3\,y \le 5,\ 0 \le 3\,x+5\,y \le 5\}$

1) 1.47929

2) 4.43787

3) 1.0355

4) −0.295858

5) 3.40237

Exercise 2

Compute $\int_D (5\,y)\,dx\,dy$ for $D=\left\{9\,y \le x^4 \le 11\,y,\ 3\,x^7 \le y^2 \le 4\,x^7,\ x>0,\ y>0\right\}$

1) 4.45489×10^{20}

2) 3.71241×10^{20}

3) 1.48496×10^{20}

4) -1.11372×10^{20}

5) 1.0766×10^{21}

Exercise 3

Compute the volume of $D=\left\{x^2+y^2+z^2 \le 49,\ z \ge 13\left(x^2+y^2\right)\right\}$

1) 10.0101

2) −5.88828

3) 14.7207

4) −1.76648

5) 5.88828

Exercise 4

Compute the volume of the domain limited by the plane $2\,x+2\,z==10$ and the paraboloid $z==6\,x^2+6\,y^2$.

1) 2.03366

2) 21.6339

3) 2.85594

4) 6.65452

5) 1.12014

Exercise 5

Compute $\int_D (x + y)\,dx\,dy\,dz$ for D=

$\left\{2 x^6 \le y^3 z^3 \le 10 x^6,\ 6 y^3 \le x^5 z^6 \le 13 y^3,\ 6 x^7 \le y^3 z^2 \le 13 x^7,\ x > 0,\ y > 0,\ z > 0\right\}$

1) -0.991889

2) -1.09189

3) 1.70811

4) 0.0081105

5) 0.808111

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 10

Exercise 1

Compute $\int_D (2x)\,dx\,dy$ for $D=\{0 \le 6x - 6y \le 8,\ 0 \le -9x \le 6\}$

1) -0.692593

2) -2.29259

3) -0.592593

4) 1.20741

5) 0.607407

Exercise 2

Compute $\int_D (6x^2)\,dx\,dy$ for $D=\left\{x^{71} \le y^{26} \le 5x^{71},\ 3y^{11} \le x^{30} \le 5y^{11},\ x > 0,\ y > 0\right\}$

1) 0.3

2) 5.18272×10^{-75}

3) 1.2

4) -0.2

5) -0.2

Exercise 3

Compute the volume of $D=\left\{x^2 + y^2 + z^2 \le 169,\ z \ge 9\sqrt{x^2 + y^2}\right\}$

1) 73.1726

2) 75.9869

3) 28.1433

4) 8.44299

5) 5.62866

Exercise 4

Compute the volume of the domain limited by the plane $8x + 3z == 4$ and the paraboloid $z == 4x^2 + 4y^2$.

1) 5.67346

2) 0.865983

3) 2.87318

4) 3.9425

5) 1.24112

Exercise 5

Compute $\int_D (x + 2y)\,dx\,dy\,dz$ for D=

$\left\{6 y^6 z^9 \le x^6 \le 11 y^6 z^9,\ 2 y^9 z^2 \le 1 \le 7 y^9 z^2,\ 4 y^3 \le x^4 z^3 \le 12 y^3,\ x > 0,\ y > 0,\ z > 0\right\}$

1) 0.00673642

2) −0.193264

3) 1.70674

4) −0.693264

5) 1.70674

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 11

Exercise 1

Compute $\int_D (2x + 3y)\,dx\,dy$ for $D = \{0 \le -6x \le 6,\ 0 \le 6x + 8y \le 5\}$

1) 0.664063

2) 2.56406

3) 0.0640625

4) 2.16406

5) 0.564063

Exercise 2

Compute $\int_D (3x + y^3)\,dx\,dy$ for $D = \left\{8x^3y^{10} \le 1 \le 11x^3y^{10},\ 5 \le xy^3 \le 14,\ x > 0,\ y > 0\right\}$

1) 2.34691×10^{23}

2) -5.52215×10^{22}

3) 2.62302×10^{23}

4) 1.51859×10^{23}

5) 1.38054×10^{23}

Exercise 3

Compute the volume of $D = \left\{x^2 + y^2 + z^2 \le 64,\ z \ge 10\left(x^2 + y^2\right)\right\}$

1) -5.99432

2) -7.99242

3) 19.9811

4) 9.99053

5) 27.9735

Exercise 4

Compute the volume of the domain limited by the plane $2x + 6z == 3$ and the paraboloid $z == 9x^2 + 9y^2$.

1) 0.0822134

2) 0.124267

3) 0.0441736

4) 0.099899

5) 0.153532

Exercise 5

Compute $\int_D (3\,x)\,dx\,dy\,dz$ for $D=\left\{8\,x^6 \le z^6 \le 17\,x^6,\ 5 \le x^8\,y^8\,z \le 8,\ 2\,y^7 \le z^4 \le 6\,y^7,\ x>0,\ y>0,\ z>0\right\}$

1) 0.104236

2) 0.00423611

3) 1.60424

4) -1.89576

5) -1.09576

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 12

Exercise 1

Compute $\int_D (3x + y)\,dx\,dy$ for $D = \{0 \le -5x + 8y \le 5,\ 0 \le -7x + 8y \le 2\}$

1) 2.65234

2) 4.92578

3) 3.2207

4) 1.89453

5) 3.41016

Exercise 2

Compute $\int_D (2x^2)\,dx\,dy$ for $D = \left\{7y^{13} \le x^3 \le 10y^{13},\ 8x^2 \le y^9 \le 17x^2,\ x > 0,\ y > 0\right\}$

1) 7.83833×10^{76}

2) 1.95958×10^{78}

3) 2.03797×10^{78}

4) 1.25413×10^{78}

5) 7.83833×10^{77}

Exercise 3

Compute the volume of $D = \left\{5\left(x^2 + y^2\right) \le z \le 49 - x^2 - y^2\right\}$

1) 817.154

2) 1760.02

3) 1760.02

4) 1760.02

5) 628.58

Exercise 4

Compute the volume of the domain limited by the plane $10x + 10z == 3$ and the paraboloid $z == 3x^2 + 3y^2$.

1) 0.0769399

2) 0.0702141

3) 0.234836

4) 0.248877

5) 0.0951021

Exercise 5

Compute $\int_D (2y + z^3)\,dx\,dy\,dz$ for D=

$\left\{4x^5 z^7 \le y^8 \le 13x^5 z^7,\ 5 \le x^8 y^8 \le 10,\ 4 \le x^9 y^6 z^5 \le 11,\ x > 0,\ y > 0,\ z > 0\right\}$

1) 0.0148578

2) 0.914858

3) 1.81486

4) 1.01486

5) 0.814858

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 13

Exercise 1

Compute $\int_D (x+y)\,dx\,dy$ for $D=\{0 \le -7x+3y \le 7,\ 0 \le 8x-4y \le 6\}$

1) $-188.$

2) -188.2

3) $-189.$

4) -188.3

5) -190.4

Exercise 2

Compute $\int_D (x^2+y)\,dx\,dy$ for $D=\left\{8y^7 \le x^4 \le 10y^7,\ 5y^5 \le x^3 \le 12y^5,\ x>0,\ y>0\right\}$

1) $0.$

2) 9.24552×10^7

3) -9.24552×10^7

4) -4.62276×10^7

5) 1.15569×10^8

Exercise 3

Compute the volume of $D=\left\{2\left(x^2+y^2\right) \le z \le 196-x^2-y^2\right\}$

1) $34\,194.8$

2) $38\,217.7$

3) $56\,320.8$

4) $20\,114.6$

5) $-18\,103.1$

Exercise 4

Compute the volume of the domain limited by the plane $5x+5z==9$ and the paraboloid $z==10x^2+10y^2$.

1) 1.43496

2) 0.523173

3) 0.643689

4) 1.81483

5) 0.10464

Exercise 5

Compute $\int_D (2x + x^2)\,dx\,dy\,dz$ for D=

$\left\{6x^7 \le y^3 z^8 \le 12x^7,\ 5x^4 y^6 \le z^8 \le 8x^4 y^6,\ 2y^3 \le x^9 z^3 \le 5y^3,\ x > 0,\ y > 0,\ z > 0\right\}$

1) 1.60191

2) −0.698088

3) 0.401912

4) 0.901912

5) 0.00191216

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 14

Exercise 1

Compute $\int_D (6\,x)\,dx\,dy$ for $D=\{0 \le 5\,x+y \le 9,\ 0 \le -2\,x+6\,y \le 5\}$

1) 9.04395

2) 11.6279

3) 1.29199

4) 6.45996

5) 10.9819

Exercise 2

Compute $\int_D (y+y^2)\,dx\,dy$ for $D=\left\{2 \le x^{23}\,y^{11} \le 10,\ 8 \le x^2\,y \le 16,\ x>0,\ y>0\right\}$

1) 2.00741×10^{66}

2) -5.20439×10^{65}

3) 1.93306×10^{66}

4) -5.20439×10^{65}

5) 7.43485×10^{65}

Exercise 3

Compute the volume of $D=\left\{x^2+y^2+z^2 \le 64,\ z \ge 7\sqrt{x^2+y^2}\right\}$

1) 19.3994

2) -2.15549

3) 17.2439

4) 18.3217

5) 10.7775

Exercise 4

Compute the volume of the domain limited by the plane $8\,x+6\,z==10$ and the paraboloid $z==4\,x^2+4\,y^2$.

1) 5.86674

2) 1.91943

3) 1.24112

4) 0.99408

5) 4.16376

Exercise 5

Compute $\int_D (2\,y)\,dx\,dy\,dz$ for $D=\left\{4 \le x^6\,y^4\,z^6 \le 13,\ 2 \le x^4\,y^5\,z \le 5,\ 8\,x^2 \le y^6 \le 13\,x^2,\ x>0,\ y>0,\ z>0\right\}$

1) 1.71404

2) 1.61404

3) −0.285962

4) 0.0140384

5) 1.11404

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 15

Exercise 1

Compute $\int_D (3x + 3y)\,dx\,dy$ for $D=\{0 \le 2x - 7y \le 4,\ 0 \le 4x + 4y \le 8\}$

1) 1.6

2) −2.4

3) −1.86667

4) 2.66667

5) 0.533333

Exercise 2

Compute $\int_D (3x^3 y)\,dx\,dy$ for $D=\left\{7 \le x^5 y^{14} \le 15,\ 9x^4 y^{11} \le 1 \le 10x^4 y^{11},\ x > 0,\ y > 0\right\}$

1) −2.

2) 1.8

3) −0.5

4) 8.62881×10^{-78}

5) 0.6

Exercise 3

Compute the volume of $D=\left\{12\left(x^2 + y^2\right) \le z \le 81 - x^2 - y^2\right\}$

1) 554.938

2) −317.108

3) −317.108

4) −158.554

5) 792.769

Exercise 4

Compute the volume of the domain limited by the plane $3x + 3z == 8$ and the paraboloid $z == 4x^2 + 4y^2$.

1) 0.436906

2) 5.38485

3) 2.92496

4) 8.5599

5) 12.8539

Exercise 5

Compute $\int_D (x^3 + y)\,dx\,dy\,dz$ for D=

$\left\{5\,y^7 \le x^2\,z^4 \le 10\,y^7,\ 5\,z^3 \le x^4\,y^2 \le 7\,z^3,\ y^9 \le x^3\,z^6 \le 4\,y^9,\ x > 0,\ y > 0,\ z > 0\right\}$

1) -0.499622

2) 0.000378392

3) -0.399622

4) -0.0996216

5) -1.59962

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 16

Exercise 1

Compute $\int_D (2x + 2y)\,dx\,dy$ for $D=\{0 \le x - 9y \le 7,\ 0 \le x - 3y \le 4\}$

1) -8.4

2) 28.

3) 6.53333

4) 15.8667

5) 9.33333

Exercise 2

Compute $\int_D (2xy)\,dx\,dy$ for $D=\left\{3y^3 \le x^4 \le 11y^3,\ 3y^8 \le x^{11} \le 7y^8,\ x > 0,\ y > 0\right\}$

1) -1.4

2) 1.4

3) -1.8

4) -1.1

5) 1.88747×10^{-9}

Exercise 3

Compute the volume of $D=\left\{11\left(x^2 + y^2\right) \le z \le 225 - x^2 - y^2\right\}$

1) -662.68

2) -2650.72

3) 11 265.6

4) 7289.48

5) 6626.8

Exercise 4

Compute the volume of the domain limited by the plane $9x + 2z == 3$ and the paraboloid $z == 8x^2 + 8y^2$.

1) 1.06499

2) 2.78747

3) 0.893172

4) 0.747449

5) 0.65224

Exercise 5

Compute $\int_D (z + z^2)\,dx\,dy\,dz$ for D=

$\left\{9\,y^9 \le x\,z \le 15\,y^9,\ 5\,x^3 \le y^4\,z \le 10\,x^3,\ 6\,x^2\,z^2 \le y^8 \le 12\,x^2\,z^2,\ x > 0,\ y > 0,\ z > 0\right\}$

1) 0.500014

2) −1.89999

3) 0.00001422

4) 0.400014

5) −0.299986

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 17

Exercise 1

Compute $\int_D (2\,x)\,dx\,dy$ for $D=\{0 \le 9\,x - y \le 5,\ 0 \le -x - 4\,y \le 8\}$

1) -0.0493791

2) -0.949379

3) 0.350621

4) 1.15062

5) -1.24938

Exercise 2

Compute $\int_D (4\,x)\,dx\,dy$ for $D=\left\{2\,y^7 \le x^2 \le 10\,y^7,\ 3\,y^3 \le x \le 11\,y^3,\ x > 0,\ y > 0\right\}$

1) -1.28206×10^{13}

2) 1.28206×10^{13}

3) -2.56413×10^{12}

4) 2.56413×10^{12}

5) 1.79489×10^{13}

Exercise 3

Compute the volume of $D=\left\{x^2 + y^2 + z^2 \le 25,\ z \ge 11\sqrt{x^2 + y^2}\right\}$

1) 1.07516

2) 1.3977

3) 0.96764

4) 0.860125

5) -1.07516

Exercise 4

Compute the volume of the domain limited by the plane $5\,x + 9\,z == 5$ and the paraboloid $z == 2\,x^2 + 2\,y^2$.

1) 0.598749

2) 0.559584

3) 0.277243

4) 0.154928

5) 0.242972

Exercise 5

Compute $\int_D (2\,x\,y^2)\,dx\,dy\,dz$ for D=

$\left\{4\,y^5 \le x^9\,z^5 \le 13\,y^5,\ 3\,x^5\,z \le y^5 \le 5\,x^5\,z,\ 7\,x^9 \le y^2\,z^4 \le 13\,x^9,\ x > 0,\ y > 0,\ z > 0\right\}$

1) -1.9473

2) 1.1527

3) -1.3473

4) 0.0527045

5) -0.347295

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 18

Exercise 1

Compute $\int_D (4\,y)\,dx\,dy$ for $D=\{0 \le -7\,x - 9\,y \le 1,\ 0 \le -6\,x - 5\,y \le 3\}$

1) 1.34931

2) 2.24931

3) 1.74931

4) 0.249307

5) -1.15069

Exercise 2

Compute $\int_D (3\,x\,y)\,dx\,dy$ for $D=\left\{5\,x^{11} \le y^{29} \le 8\,x^{11},\ 8\,y^8 \le x^3 \le 9\,y^8,\ x > 0,\ y > 0\right\}$

1) 1.3

2) 4.04595×10^{-91}

3) -2.

4) 1.1

5) -1.9

Exercise 3

Compute the volume of $D=\left\{x^2 + y^2 + z^2 \le 36,\ z \ge 9\left(x^2 + y^2\right)\right\}$

1) 9.33805

2) 18.6761

3) 5.60283

4) 8.71551

5) 6.22537

Exercise 4

Compute the volume of the domain limited by the plane $2\,x + 7\,z == 3$ and the paraboloid $z == x^2 + y^2$.

1) 1.32193

2) 0.848821

3) 0.36858

4) 0.265681

5) 0.316645

Exercise 5

Compute $\int_D (x+y)\,dx\,dy\,dz$ for D=

$$\left\{9x^7y^9z^6 \le 1 \le 16x^7y^9z^6,\ 2x^5z^8 \le y^2 \le 9x^5z^8,\ 9x^3y^4 \le 1 \le 11x^3y^4,\ x>0,\ y>0,\ z>0\right\}$$

1) −0.498688

2) 1.50131

3) 0.601312

4) 0.701312

5) 0.00131229

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 19

Exercise 1

Compute $\int_D (2x + 2y)\,dx\,dy$ for $D = \{0 \le -6y \le 4,\ 0 \le -2x + 3y \le 6\}$

1) -9.23333

2) -7.33333

3) -9.33333

4) -9.13333

5) -9.93333

Exercise 2

Compute $\int_D (2x^2)\,dx\,dy$ for $D = \left\{8x^5y^3 \le 1 \le 11x^5y^3,\ 6x^{23}y^{14} \le 1 \le 13x^{23}y^{14},\ x > 0,\ y > 0\right\}$

1) -1.

2) 1.2

3) -1.1

4) -0.8

5) 4.96692×10^{-15}

Exercise 3

Compute the volume of $D = \left\{x^2 + y^2 + z^2 \le 9,\ z \ge 4\sqrt{x^2 + y^2}\right\}$

1) 1.6884

2) 3.88332

3) 3.03912

4) 2.87028

5) -1.18188

Exercise 4

Compute the volume of the domain limited by the plane $5x + 9z == 7$ and the paraboloid $z == 9x^2 + 9y^2$.

1) 0.0994897

2) 0.325816

3) 0.0979995

4) 0.125799

5) 0.107922

Exercise 5

Compute $\int_D (2\,x^3)\,dx\,dy\,dz$ for D=

$\left\{7\,y^6\,z^2 \le 1 \le 9\,y^6\,z^2,\ 6\,y^3 \le x^3\,z^7 \le 13\,y^3,\ 6\,x^7\,z^5 \le y^3 \le 10\,x^7\,z^5,\ x > 0,\ y > 0,\ z > 0\right\}$

1) 0.0000306391

2) 1.60003

3) -1.59997

4) 0.700031

5) 2.00003

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 20

Exercise 1

Compute $\int_D (3x + 2y)\,dx\,dy$ for $D = \{0 \le 5x + 4y \le 3,\ 0 \le -3x - 7y \le 7\}$

1) -0.351323

2) -0.468431

3) 0.702647

4) 2.57637

5) 1.17108

Exercise 2

Compute $\int_D (3x + y^3)\,dx\,dy$ for $D = \{7x^3y^7 \le 1 \le 13x^3y^7,\ 9x^2y^5 \le 1 \le 15x^2y^5,\ x > 0,\ y > 0\}$

1) $-25\,302.9$

2) $116\,393.$

3) $25\,302.9$

4) $50\,605.7$

5) 5060.57

Exercise 3

Compute the volume of $D = \{7(x^2 + y^2) \le z \le 144 - x^2 - y^2\}$

1) 1221.45

2) 2850.05

3) -1628.6

4) 4071.5

5) $10\,178.8$

Exercise 4

Compute the volume of the domain limited by the plane $10x + z == 3$ and the paraboloid $z == 9x^2 + 9y^2$.

1) 3.46753

2) 5.82638

3) 20.1379

4) 13.4544

5) 12.5462

Exercise 5

Compute $\int_D (z + z^2)\, dx\, dy\, dz$ for D=

$\left\{9 z^3 \le x^5 y^4 \le 15 z^3,\ x^7 y^4 z^2 \le 1 \le 10 x^7 y^4 z^2,\ 2 x^4 z^3 \le y^8 \le 6 x^4 z^3,\ x > 0,\ y > 0,\ z > 0\right\}$

1) -1.29851

2) 0.901493

3) 0.00149291

4) -1.59851

5) -1.59851

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 21

Exercise 1

Compute $\int_D (3x + y)\,dx\,dy$ for $D = \{0 \le 4x + 2y \le 3,\ 0 \le -8x - 7y \le 8\}$

1) -1.83333

2) 4.58333

3) -2.75

4) 1.375

5) 12.375

Exercise 2

Compute $\int_D (2y^2)\,dx\,dy$ for $D = \{6y^3 \le x \le 13y^3,\ 6x^2 \le y^7 \le 10x^2,\ x > 0,\ y > 0\}$

1) 7.40338×10^{18}

2) 1.55471×10^{19}

3) 1.25857×10^{19}

4) -1.48068×10^{18}

5) -7.40338×10^{18}

Exercise 3

Compute the volume of $D = \{6(x^2 + y^2) \le z \le 196 - x^2 - y^2\}$

1) -6034.37

2) 18965.2

3) 8620.53

4) 862.053

5) -6896.42

Exercise 4

Compute the volume of the domain limited by the plane $6x + 7z == 2$ and the paraboloid $z == 2x^2 + 2y^2$.

1) 0.505158

2) 0.100331

3) 0.235299

4) 0.111954

5) 0.100045

Exercise 5

Compute $\int_D (x + z^2)\,dx\,dy\,dz$ for $D=\left\{z^8 \le x^4 y^2 \le 10\, z^8,\ 4\, x^7 \le y^8 z \le 8\, x^7,\ 4 \le x\, y^4 \le 9,\ x > 0,\ y > 0,\ z > 0\right\}$

1) -1.67724

2) 0.72276

3) -1.57724

4) 0.0227604

5) -0.97724

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 22

Exercise 1

Compute $\int_D (3\,y)\,dx\,dy$ for $D=\{0 \le -2\,x+y \le 7,\ 0 \le -9\,x+5\,y \le 8\}$

1) -3949.5

2) -3949.

3) -3947.7

4) -3948.

5) -3946.

Exercise 2

Compute $\int_D (2\,x\,y)\,dx\,dy$ for $D=\left\{8 \le x^5\,y^{11} \le 14,\ 5 \le x^4\,y^9 \le 10,\ x>0,\ y>0\right\}$

1) -5.9005

2) 23.602

3) -7.86734

4) 19.6683

5) -7.86734

Exercise 3

Compute the volume of $D=\left\{x^2+y^2+z^2 \le 36,\ z \ge 5\sqrt{x^2+y^2}\right\}$

1) 17.5702

2) 24.5983

3) 5.27106

4) -1.75702

5) 8.7851

Exercise 4

Compute the volume of the domain limited by the plane $6\,x+5\,z==9$ and the paraboloid $z==4\,x^2+4\,y^2$.

1) 6.33043

2) 5.52691

3) 3.71432

4) 1.40276

5) 0.689872

Exercise 5

Compute $\int_D (x + y^3)\,dx\,dy\,dz$ for $D=\left\{8\,x^2\,z^9 \le y \le 15\,x^2\,z^9,\ 6 \le x^5\,y\,z^3 \le 7,\ x^3 \le y^6\,z^2 \le 5\,x^3,\ x > 0,\ y > 0,\ z > 0\right\}$

1) −0.793952

2) 0.406048

3) −0.593952

4) 0.00604784

5) 0.106048

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 23

Exercise 1

Compute $\int_D (5\,y)\,dx\,dy$ for $D=\{0 \le 5x+y \le 5,\ 0 \le -x-2y \le 2\}$

1) -2.62963

2) -2.62963

3) -3.72963

4) -2.72963

5) -4.62963

Exercise 2

Compute $\int_D (x^3+y)\,dx\,dy$ for $D=\left\{2x^2y \le 1 \le 9x^2y,\ 7x^3y^2 \le 1 \le 15x^3y^2,\ x>0,\ y>0\right\}$

1) 1.97823

2) -0.791293

3) 3.363

4) 0.197823

5) 3.16517

Exercise 3

Compute the volume of $D=\left\{x^2+y^2+z^2 \le 49,\ z \ge 11\left(x^2+y^2\right)\right\}$

1) 20.8558

2) 7.64714

3) 13.9039

4) 14.5991

5) 6.95194

Exercise 4

Compute the volume of the domain limited by the plane $7x+6z==3$ and the paraboloid $z==x^2+y^2$.

1) 1.99596

2) 0.994604

3) 0.493906

4) 1.10909

5) 3.98194

Exercise 5

Compute $\int_D (2y + 2z)\,dx\,dy\,dz$ for D=

$\{8z \le x^5 y \le 13z,\ 6x^2 z^3 \le y^3 \le 11x^2 z^3,\ 4x^7 z^2 \le y^8 \le 13x^7 z^2,\ x > 0,\ y > 0,\ z > 0\}$

1) 0.0162968

2) 0.116297

3) 0.516297

4) 1.2163

5) 0.916297

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 24

Exercise 1

Compute $\int_D (2\,y)\,dx\,dy$ for $D=\{0 \le 5\,x+7\,y \le 9,\ 0 \le 6\,x-9\,y \le 6\}$

1) -1.02878

2) 0.771225

3) 0.171225

4) 2.17122

5) 1.47122

Exercise 2

Compute $\int_D (6\,x^2)\,dx\,dy$ for $D=\left\{8 \le x^5\,y^2 \le 17,\ 3 \le x^{12}\,y^5 \le 11,\ x>0,\ y>0\right\}$

1) 2133.82

2) 213.382

3) 4481.02

4) 3627.49

5) 640.145

Exercise 3

Compute the volume of $D=\left\{12\left(x^2+y^2\right) \le z \le 100-x^2-y^2\right\}$

1) 1208.3

2) 3141.59

3) 3624.91

4) 3262.42

5) -604.152

Exercise 4

Compute the volume of the domain limited by the plane $7\,x+10\,z==4$ and the paraboloid $z==x^2+y^2$.

1) 1.06857

2) 0.428837

3) 0.30129

4) 0.187564

5) 1.22306

Exercise 5

Compute $\int_D (3x + 3z)\,dx\,dy\,dz$ for D=

$\left\{1 \le x^5 y^7 z^6 \le 3,\ 4x^9 y^5 z^4 \le 1 \le 6x^9 y^5 z^4,\ 8z^4 \le x^2 y^3 \le 16z^4,\ x > 0,\ y > 0,\ z > 0\right\}$

1) 0.00482577

2) 1.40483

3) 1.70483

4) 1.00483

5) -1.39517

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 25

Exercise 1

Compute $\int_D (3x + 2y)\,dx\,dy$ for $D=\{0 \le 5x - 7y \le 8,\ 0 \le 2x - 6y \le 6\}$

1) -1.8375

2) -0.2375

3) -0.9375

4) -1.9375

5) -2.1375

Exercise 2

Compute $\int_D (x + y^3)\,dx\,dy$ for $D=\left\{7y^3 \le x^{13} \le 13y^3,\ y^5 \le x^{22} \le 7y^5,\ x > 0,\ y > 0\right\}$

1) 0.2

2) -1.9

3) 0.8

4) 1.69755×10^{-14}

5) 1.5

Exercise 3

Compute the volume of $D=\left\{13\left(x^2 + y^2\right) \le z \le 64 - x^2 - y^2\right\}$

1) 321.699

2) 643.398

3) -229.785

4) -91.914

5) 459.57

Exercise 4

Compute the volume of the domain limited by the plane $10x + 4z == 7$ and the paraboloid $z == 2x^2 + 2y^2$.

1) 16.3057

2) 8.97951

3) 0.388098

4) 2.41741

5) 5.03222

Exercise 5

Compute $\int_D (x^2\, z)\, dx\, dy\, dz$ for $D=\left\{7\, y^7 \le x^5\, z^2 \le 13\, y^7,\ 4\, x^6 \le y\, z^4 \le 13\, x^6,\ 9\, x \le y^2 \le 15\, x,\ x > 0,\ y > 0,\ z > 0\right\}$

1) 114 602.

2) 38 200.6

3) 725 811.

4) 382 006.

5) 0.

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 26

Exercise 1

Compute $\int_D (4\,y)\,dx\,dy$ for $D=\{0 \le x+2\,y \le 4,\ 0 \le -4\,x+2\,y \le 8\}$

1) -9.216

2) -13.824

3) 13.824

4) 43.008

5) 15.36

Exercise 2

Compute $\int_D (2\,x^2\,y)\,dx\,dy$ for $D=\left\{8\,x^3 \le y^4 \le 16\,x^3,\ 2\,x^7 \le y^9 \le 11\,x^7,\ x>0,\ y>0\right\}$

1) 6.52705×10^{41}

2) 2.41742×10^{41}

3) 5.56008×10^{41}

4) 5.80182×10^{41}

5) -2.41742×10^{41}

Exercise 3

Compute the volume of $D=\left\{x^2+y^2+z^2 \le 36,\ z \ge 6\sqrt{x^2+y^2}\right\}$

1) -1.23105

2) 2.4621

3) 6.15524

4) -3.07762

5) 13.5415

Exercise 4

Compute the volume of the domain limited by the plane $6\,x+6\,z==8$ and the paraboloid $z==8\,x^2+8\,y^2$.

1) 0.929668

2) 0.36562

3) 0.163712

4) 0.17994

5) 0.217349

Exercise 5

Compute $\int_D (y^3 + 2z)\,dx\,dy\,dz$ for $D=$

$\{3z^4 \le xy^2 \le 9z^4,\ 7z^3 \le x^2y^5 \le 14z^3,\ 8y^5z^6 \le 1 \le 16y^5z^6,\ x>0,\ y>0,\ z>0\}$

1) 0.312466

2) 0.812466

3) -1.08753

4) -1.38753

5) -1.18753

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 27

Exercise 1

Compute $\int_D (2y)\,dx\,dy$ for $D=\{0 \le -2x-8y \le 2,\ 0 \le -2y \le 9\}$

1) -19.25

2) -18.65

3) -18.55

4) -20.25

5) -21.75

Exercise 2

Compute $\int_D (x y^2)\,dx\,dy$ for $D=\left\{9y^2 \le x^5 \le 13y^2,\ y^5 \le x^{13} \le 9y^5,\ x>0,\ y>0\right\}$

1) 1.4

2) -1.5

3) 1.5

4) 2.53382×10^{-32}

5) 0.8

Exercise 3

Compute the volume of $D=\left\{x^2+y^2+z^2 \le 225,\ z \ge 2\left(x^2+y^2\right)\right\}$

1) 208.562

2) 173.802

3) 34.7604

4) 504.025

5) 347.604

Exercise 4

Compute the volume of the domain limited by the plane $4x+9z==7$ and the paraboloid $z==10x^2+10y^2$.

1) 0.138852

2) 0.096234

3) 0.425928

4) 0.0877669

5) 0.0953827

Exercise 5

Compute $\int_D (x^3 y)\,dx\,dy\,dz$ for D=

$\left\{5 x^2 y^8 \le 1 \le 9 x^2 y^8,\ 4 x^2 z^8 \le y^9 \le 11 x^2 z^8,\ 3 z^8 \le x^7 y^9 \le 7 z^8,\ x > 0,\ y > 0,\ z > 0\right\}$

1) 0.000294743

2) 0.900295

3) 1.30029

4) 1.90029

5) -1.49971

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 28

Exercise 1

Compute $\int_D (3\,x)\,dx\,dy$ for $D=\{0 \le 7\,x - y \le 9,\ 0 \le -5\,x - 4\,y \le 9\}$

1) 7.53099

2) -2.40992

3) 2.40992

4) 3.0124

5) 2.71116

Exercise 2

Compute $\int_D (x + y)\,dx\,dy$ for $D=\left\{2 \le x\,y^2 \le 4,\ 5\,x^4\,y^7 \le 1 \le 11\,x^4\,y^7,\ x > 0,\ y > 0\right\}$

1) 1.57691

2) 3.6269

3) 3.46921

4) -0.473074

5) 4.25767

Exercise 3

Compute the volume of $D=\left\{13\left(x^2 + y^2\right) \le z \le 144 - x^2 - y^2\right\}$

1) 1163.29

2) -1628.6

3) 232.657

4) 2326.57

5) 6979.72

Exercise 4

Compute the volume of the domain limited by the plane $3\,x + z == 8$ and the paraboloid $z == 3\,x^2 + 3\,y^2$.

1) 64.5424

2) 40.088

3) 7.06703

4) 168.423

5) 184.424

Exercise 5

Compute $\int_D (3y + z)\,dx\,dy\,dz$ for D=

$\{5yz^5 \le x^7 \le 11yz^5,\ 6x^4y^5 \le z^6 \le 8x^4y^5,\ 6y^5z^9 \le x \le 14y^5z^9,\ x > 0,\ y > 0,\ z > 0\}$

1) 0.101069

2) −0.798931

3) −1.89893

4) −0.398931

5) 0.00106868

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 29

Exercise 1

Compute $\int_D (5\,y)\,dx\,dy$ for $D=\{0 \le 9\,y \le 8,\ 0 \le -6\,x - 9\,y \le 5\}$

1) -0.164609

2) -1.15226

3) 1.64609

4) 1.97531

5) -0.164609

Exercise 2

Compute $\int_D (y^3)\,dx\,dy$ for $D=\left\{5 \le x\,y^3 \le 12,\ 2 \le x\,y^4 \le 8,\ x > 0,\ y > 0\right\}$

1) 5.25281

2) -1.57584

3) 5.77809

4) 6.82866

5) 6.82866

Exercise 3

Compute the volume of $D=\left\{10\left(x^2+y^2\right) \le z \le 100 - x^2 - y^2\right\}$

1) -856.798

2) 3141.59

3) 1142.4

4) -999.598

5) 1428.

Exercise 4

Compute the volume of the domain limited by the plane $7\,x + 5\,z == 4$ and the paraboloid $z == 9\,x^2 + 9\,y^2$.

1) 0.450988

2) 0.103523

3) 0.113826

4) 0.107493

5) 0.127422

Exercise 5

Compute $\int_D (3\,x\,z)\,dx\,dy\,dz$ for $D=\left\{z^6 \le y^9 \le 10\,z^6,\ 5\,x^9\,z^3 \le y^6 \le 13\,x^9\,z^3,\ 1 \le x\,y^7\,z \le 3,\ x>0,\ y>0,\ z>0\right\}$

1) 1.51212

2) 0.012123

3) -1.88788

4) -1.28788

5) -0.887877

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 30

Exercise 1

Compute $\int_D (3x + y)\,dx\,dy$ for $D = \{0 \le 4x - 9y \le 1,\ 0 \le -9x - 3y \le 1\}$

1) 0.898208

2) -1.90179

3) 1.69821

4) -0.00179211

5) -1.90179

Exercise 2

Compute $\int_D (xy)\,dx\,dy$ for $D = \left\{x^{14} \le y^{37} \le 8x^{14},\ 8y^8 \le x^3 \le 17y^8,\ x > 0,\ y > 0\right\}$

1) 3.41821×10^{-96}

2) -0.9

3) -0.5

4) -1.

5) -1.

Exercise 3

Compute the volume of $D = \left\{x^2 + y^2 + z^2 \le 121,\ z \ge \sqrt{x^2 + y^2}\right\}$

1) 816.481

2) -81.6481

3) 1388.02

4) 898.129

5) -816.481

Exercise 4

Compute the volume of the domain limited by the plane $7x + 9z == 1$ and the paraboloid $z == 2x^2 + 2y^2$.

1) 0.110959

2) 0.0273849

3) 0.0514921

4) 0.0924135

5) 0.0668905

Exercise 5

Compute $\int_D (4\,x\,y)\,dx\,dy\,dz$ for D=

$\left\{3\,y^9\,z^9 \le x^4 \le 7\,y^9\,z^9,\ 5\,x^3\,z^9 \le y \le 7\,x^3\,z^9,\ 9\,z \le x^6\,y^7 \le 17\,z,\ x > 0,\ y > 0,\ z > 0\right\}$

1) -1.79885

2) 0.801146

3) 0.00114603

4) -0.198854

5) 1.70115

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 31

Exercise 1

Compute $\int_D (5\,x)\,dx\,dy$ for $D=\{0 \le 4\,x - 2\,y \le 9,\ 0 \le -8\,x - 7\,y \le 3\}$

1) -1.39114

2) 1.39114

3) 1.98735

4) 0.596204

5) 1.19241

Exercise 2

Compute $\int_D (y + y^2)\,dx\,dy$ for $D=\left\{9 \le x^7\,y^3 \le 11,\ 9\,x^{26}\,y^{11} \le 1 \le 12\,x^{26}\,y^{11},\ x > 0,\ y > 0\right\}$

1) 3.51668×10^{86}

2) 1.69322×10^{86}

3) 1.30247×10^{86}

4) 3.90742×10^{85}

5) 1.82346×10^{86}

Exercise 3

Compute the volume of $D=\left\{x^2 + y^2 + z^2 \le 144,\ z \ge 5\,\sqrt{x^2 + y^2}\right\}$

1) 70.2808

2) 7.02808

3) 56.2246

4) 14.0562

5) 49.1965

Exercise 4

Compute the volume of the domain limited by the plane $7\,x + 4\,z == 3$ and the paraboloid $z == 8\,x^2 + 8\,y^2$.

1) 0.686373

2) 0.392711

3) 0.107817

4) 0.140432

5) 0.101386

Exercise 5

Compute $\int_D (z + z^2)\, dx\, dy\, dz$ for D=

$\left\{9\, y^2\, z^8 \le x^4 \le 14\, y^2\, z^8,\ 6\, x^7\, y \le z^7 \le 10\, x^7\, y,\ 2\, y^7\, z^6 \le x^2 \le 3\, y^7\, z^6,\ x > 0,\ y > 0,\ z > 0\right\}$

1) -0.599971

2) -0.999971

3) 0.0000288205

4) -1.59997

5) -1.09997

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 32

Exercise 1

Compute $\int_D (2x + y)\,dx\,dy$ for $D = \{0 \le 7x - 2y \le 3,\ 0 \le -9x + 2y \le 6\}$

1) -59.0625

2) -57.7625

3) -57.0625

4) -61.0625

5) -58.0625

Exercise 2

Compute $\int_D (2x + x^3)\,dx\,dy$ for $D = \left\{3 \le x\,y^3 \le 9,\ 2x^6 y^{17} \le 1 \le 11x^6 y^{17},\ x > 0,\ y > 0\right\}$

1) 2.

2) 1.95106×10^{-17}

3) 0.3

4) -0.7

5) -0.8

Exercise 3

Compute the volume of $D = \left\{11\left(x^2 + y^2\right) \le z \le 4 - x^2 - y^2\right\}$

1) 1.0472

2) 2.30383

3) 4.60767

4) 3.76991

5) 2.0944

Exercise 4

Compute the volume of the domain limited by the plane $9x + 7z == 9$ and the paraboloid $z == x^2 + y^2$.

1) 0.984678

2) 4.53415

3) 0.428633

4) 10.7769

5) 11.1903

Exercise 5

Compute $\int_D (3\,z^2)\,dx\,dy\,dz$ for D=

$\left\{9\,y^2\,z^9 \le x^7 \le 17\,y^2\,z^9,\ 5\,y^5 \le x^2\,z^9 \le 11\,y^5,\ x^3\,y^5 \le z^7 \le 7\,x^3\,y^5,\ x > 0,\ y > 0,\ z > 0\right\}$

1) -0.593411

2) 2.00659

3) 1.80659

4) 0.706589

5) 0.00658944

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 33

Exercise 1

Compute $\int_D (2\,x)\,dx\,dy$ for $D=\{0 \le 9\,x+6\,y \le 6,\ 0 \le -3\,x-3\,y \le 4\}$

1) 17.4222

2) 37.3333

3) 16.1778

4) 8.71111

5) 12.4444

Exercise 2

Compute $\int_D (x+3\,y)\,dx\,dy$ for $D=\left\{3\,x\,y \le 1 \le 9\,x\,y,\ 5 \le x^2\,y \le 12,\ x>0,\ y>0\right\}$

1) 11.5417

2) 7.69445

3) 20.775

4) 13.85

5) -1.53889

Exercise 3

Compute the volume of $D=\left\{4\left(x^2+y^2\right) \le z \le 25-x^2-y^2\right\}$

1) -196.35

2) 392.699

3) 196.35

4) 215.984

5) 294.524

Exercise 4

Compute the volume of the domain limited by the plane $10\,x+4\,z==4$ and the paraboloid $z==4\,x^2+4\,y^2$.

1) 3.07078

2) 0.759416

3) 2.9209

4) 0.454975

5) 3.09073

Exercise 5

Compute $\int_D (x + z^3)\,dx\,dy\,dz$ for $D=\left\{z^3 \le x^9 y^6 \le 6 z^3,\ 7 x^3 y^9 \le 1 \le 16 x^3 y^9,\ 8 \le x y^5 z^3 \le 9,\ x > 0,\ y > 0,\ z > 0\right\}$

1) 1.95992

2) −0.440082

3) 1.35992

4) 0.359918

5) 2.05992

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 34

Exercise 1

Compute $\int_D (4\,y)\,dx\,dy$ for $D=\{0 \le -3\,x - 4\,y \le 3,\ 0 \le 3\,y \le 2\}$

1) 0.288889

2) 1.18889

3) 0.688889

4) −0.411111

5) 0.888889

Exercise 2

Compute $\int_D (x + y^3)\,dx\,dy$ for $D=\left\{3\,y^2 \le x^9 \le 5\,y^2,\ x^{13} \le y^3 \le 2\,x^{13},\ x > 0,\ y > 0\right\}$

1) 3.65043×10^{46}

2) -1.46017×10^{46}

3) 9.85616×10^{46}

4) 4.38051×10^{46}

5) 3.65043×10^{45}

Exercise 3

Compute the volume of $D=\left\{7\,\left(x^2 + y^2\right) \le z \le 81 - x^2 - y^2\right\}$

1) 1288.25

2) 0.

3) −386.475

4) 2962.97

5) 515.3

Exercise 4

Compute the volume of the domain limited by the plane $2\,x + 9\,z == 8$ and the paraboloid $z == 5\,x^2 + 5\,y^2$.

1) 0.187498

2) 0.792649

3) 0.153686

4) 0.249606

5) 0.750939

Exercise 5

Compute $\int_D (x + y)\,dx\,dy\,dz$ for D=

$\left\{3 x^3 y^4 \le 1 \le 5 x^3 y^4,\ z^7 \le x^3 y^3 \le 4 z^7,\ x^7 y^5 \le z^2 \le 8 x^7 y^5,\ x > 0,\ y > 0,\ z > 0\right\}$

1) -0.282325

2) 0.0176754

3) -1.88232

4) 1.31768

5) -1.28232

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 35

Exercise 1

Compute $\int_D (2x + 2y)\,dx\,dy$ for $D=\{0 \le -9x + 2y \le 9,\ 0 \le 6x + 7y \le 2\}$

1) 1.4416

2) 0.0416

3) 0.4416

4) 0.5416

5) −1.5584

Exercise 2

Compute $\int_D (x^2 + 3y)\,dx\,dy$ for $D=\left\{9x^7 \le y^9 \le 11x^7,\ 6x^4 \le y^5 \le 13x^4,\ x > 0,\ y > 0\right\}$

1) 0.7

2) 1.3

3) −1.

4) 0.8

5) 4.06637×10^{-7}

Exercise 3

Compute the volume of $D=\left\{x^2 + y^2 + z^2 \le 1,\ z \ge 12\left(x^2 + y^2\right)\right\}$

1) 0.125595

2) −0.374405

3) 1.72559

4) 1.82559

5) 1.52559

Exercise 4

Compute the volume of the domain limited by the plane $x + 3z == 1$ and the paraboloid $z == 8x^2 + 8y^2$.

1) 0.0649569

2) 0.0255218

3) 0.0222735

4) 0.0675239

5) 0.0264655

Exercise 5

Compute $\int_D (3x + 2y)\,dx\,dy\,dz$ for $D=$

$\{4x^9 \le y^2 z^6 \le 12x^9,\ 5y^5 \le x^7 z^4 \le 9y^5,\ 8x^6 \le y^4 z^5 \le 13x^6,\ x > 0,\ y > 0,\ z > 0\}$

1) 1.51844

2) 0.818435

3) 0.0184351

4) −1.48156

5) 0.618435

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 36

Exercise 1

Compute $\int_D (3x + 2y)\,dx\,dy$ for $D = \{0 \le 4x - 8y \le 5,\ 0 \le -x - 3y \le 3\}$

1) 0.15625

2) 0.55625

3) −0.34375

4) −1.14375

5) −1.74375

Exercise 2

Compute $\int_D (x + y)\,dx\,dy$ for $D = \left\{2x^9 \le y^{13} \le 7x^9,\ 3x^7 \le y^{10} \le 10x^7,\ x > 0,\ y > 0\right\}$

1) 2529.45

2) −361.35

3) 1806.75

4) 5239.58

5) −542.025

Exercise 3

Compute the volume of $D = \left\{x^2 + y^2 + z^2 \le 144,\ z \ge 10\sqrt{x^2 + y^2}\right\}$

1) 34.1259

2) 17.961

3) 21.5532

4) 5.38829

5) 43.1063

Exercise 4

Compute the volume of the domain limited by the plane $7x + 5z == 4$ and the paraboloid $z == 5x^2 + 5y^2$.

1) 0.148419

2) 0.8908

3) 0.253339

4) 1.01065

5) 0.904137

Exercise 5

Compute $\int_D (x^3 + 2y)\,dx\,dy\,dz$ for D=

$\{9y^8 z \le x^4 \le 13y^8 z,\ 8x^3 z \le y^4 \le 14x^3 z,\ 6z^6 \le y^7 \le 13z^6,\ x > 0,\ y > 0,\ z > 0\}$

1) 0.400034

2) 0.300034

3) -0.0999655

4) 0.600034

5) 0.0000344699

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 37

Exercise 1

Compute $\int_D (4\,y)\,dx\,dy$ for $D=\{0 \le 6\,x - 6\,y \le 1,\ 0 \le -6\,x + y \le 9\}$

1) 0.6

2) 0.5

3) −0.5

4) −2.5

5) −1.2

Exercise 2

Compute $\int_D (x\,y)\,dx\,dy$ for $D=\left\{5\,y^3 \le x^4 \le 8\,y^3,\ 4\,x^5 \le y^4 \le 8\,x^5,\ x > 0,\ y > 0\right\}$

1) -2.51449×10^{26}

2) 3.14312×10^{26}

3) 8.1721×10^{26}

4) -3.14312×10^{26}

5) 8.48642×10^{26}

Exercise 3

Compute the volume of $D=\left\{x^2 + y^2 + z^2 \le 36,\ z \ge 2\sqrt{x^2 + y^2}\right\}$

1) 133.728

2) −9.552

3) 90.744

4) 90.744

5) 47.76

Exercise 4

Compute the volume of the domain limited by the plane $8\,x + 5\,z == 8$ and the paraboloid $z == 2\,x^2 + 2\,y^2$.

1) 5.89344

2) 10.1688

3) 1.19194

4) 2.89529

5) 2.57971

Exercise 5

Compute $\int_D (4\,y)\,dx\,dy\,dz$ for $D=\left\{8\,y^6\,z^6 \le x^6 \le 14\,y^6\,z^6,\ 4 \le x\,y^7\,z^7 \le 6,\ z^8 \le x^3\,y^8 \le 10\,z^8,\ x>0,\ y>0,\ z>0\right\}$

1) 0.805696

2) 1.1057

3) 1.1057

4) 0.00569566

5) -1.0943

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 38

Exercise 1

Compute $\int_D (2x + y)\,dx\,dy$ for $D = \{0 \le y \le 7,\ 0 \le -6x + 4y \le 5\}$

1) 17.1111

2) 115.5

3) 64.1667

4) −4.27778

5) 42.7778

Exercise 2

Compute $\int_D (y^2 + y^3)\,dx\,dy$ for $D = \left\{4y \le x \le 10y,\ 3y^2 \le x^3 \le 7y^2,\ x > 0,\ y > 0\right\}$

1) 1.20001

2) 1.80001

3) 0.0000134521

4) −1.59999

5) −1.69999

Exercise 3

Compute the volume of $D = \left\{x^2 + y^2 + z^2 \le 9,\ z \ge 11\sqrt{x^2 + y^2}\right\}$

1) −0.167766

2) −1.16777

3) 2.23223

4) 0.232234

5) 0.632234

Exercise 4

Compute the volume of the domain limited by the plane $5x + 7z == 4$ and the paraboloid $z == 7x^2 + 7y^2$.

1) 0.0780208

2) 0.0977944

3) 0.378573

4) 0.0706353

5) 0.1493

Exercise 5

Compute $\int_D (2\,x\,z^2)\,dx\,dy\,dz$ for $D=\left\{z^6 \le y \le 10\,z^6,\ 8\,y^6 \le x^4\,z^2 \le 16\,y^6,\ 9\,z^2 \le x\,y^2 \le 13\,z^2,\ x>0,\ y>0,\ z>0\right\}$

1) 0.271671

2) 1.87167

3) −0.0283288

4) −1.02833

5) 2.07167

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 39

Exercise 1

Compute $\int_D (4\,y)\,dx\,dy$ for $D=\{0 \le -9\,y \le 5,\ 0 \le -9\,x \le 5\}$

1) 0.557064

2) −0.342936

3) 0.857064

4) −0.442936

5) 0.157064

Exercise 2

Compute $\int_D (2\,x\,y)\,dx\,dy$ for $D=\left\{2 \le x^{10}\,y^{23} \le 6,\ 7\,x^{17}\,y^{39} \le 1 \le 10\,x^{17}\,y^{39},\ x > 0,\ y > 0\right\}$

1) 1.05851×10^{-38}

2) 1.1

3) −0.5

4) 0.3

5) −1.7

Exercise 3

Compute the volume of $D=\left\{x^2 + y^2 + z^2 \le 16,\ z \ge \sqrt{x^2 + y^2}\right\}$

1) 39.2598

2) 106.001

3) 58.8897

4) 102.075

5) −3.92598

Exercise 4

Compute the volume of the domain limited by the plane $5\,x + 2\,z == 2$ and the paraboloid $z == 5\,x^2 + 5\,y^2$.

1) 0.796481

2) 0.541188

3) 0.380054

4) 1.95457

5) 0.217419

Exercise 5

Compute $\int_D (x^3 + z)\,dx\,dy\,dz$ for D=

$\{2\,y^9\,z^9 \le 1 \le 10\,y^9\,z^9,\ 6\,y \le z^8 \le 7\,y,\ 2\,y^9\,z \le x \le 11\,y^9\,z,\ x > 0,\ y > 0,\ z > 0\}$

1) 0.00173939

2) 0.601739

3) −0.998261

4) 1.10174

5) 1.50174

Further Mathematics - 2022/2023
Exam - 2 - Multivariate Integration for serial number: 40

Exercise 1

Compute $\int_D (2x + y)\,dx\,dy$ for $D = \{0 \le 7x + 8y \le 5,\ 0 \le -x + 7y \le 6\}$

1) 0.896953

2) −1.20305

3) −0.103047

4) 0.396953

5) 0.0969529

Exercise 2

Compute $\int_D (2x)\,dx\,dy$ for $D = \left\{2 \le x^3 y^{13} \le 6,\ 5x y^4 \le 1 \le 14x y^4,\ x > 0,\ y > 0\right\}$

1) −1.3

2) −0.9

3) −0.6

4) −1.7

5) 8.1374×10^{-21}

Exercise 3

Compute the volume of $D = \left\{8\left(x^2 + y^2\right) \le z \le 4 - x^2 - y^2\right\}$

1) 7.53982

2) −2.23402

3) 5.3058

4) 2.79253

5) 0.837758

Exercise 4

Compute the volume of the domain limited by the plane $9x + 6z == 2$ and the paraboloid $z == 5x^2 + 5y^2$.

1) 0.0889126

2) 0.0664774

3) 0.0624446

4) 0.078524

5) 0.189765

Exercise 5

Compute $\int_D (y+z)\,dx\,dy\,dz$ for D=

$\left\{3z \le x^7 y^8 \le 11z,\ 8y^3 \le x^7 z^4 \le 16y^3,\ 9y^4 \le x^9 z^3 \le 17y^4,\ x>0,\ y>0,\ z>0\right\}$

1) 0.0145698

2) 1.51457

3) -1.68543

4) 1.71457

5) -0.98543