

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 1

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 169, z \geq 15(x^2 + y^2)\}$

- 1) 17.6523
- 2) 30.009
- 3) 19.4176
- 4) -3.53047
- 5) 42.3656

Exercise 2

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

- 1) -0.208333
- 2) -1.40833
- 3) 1.49167
- 4) 0.191667
- 5) 0.991667

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02-Multivariate integral-Hand exam for serial number: 2

Exercise 1

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

- 1) 32.1219
- 2) -25.6976
- 3) -6.42439
- 4) 54.6073
- 5) -19.2732

Exercise 2

Compute $\int_D (5y) \, dx \, dy$ for $D = \{0 \leq -4x + 8y \leq 1, 0 \leq 6x - 3y \leq 5\}$

- 1) 0.0507716
- 2) -1.14923
- 3) 0.250772
- 4) -0.449228
- 5) 1.05077

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02-Multivariate integral-Hand exam for serial number: 3

Exercise 1

Compute the volume of $D = \{14(x^2 + y^2) \leq z \leq 121 - x^2 - y^2\}$

- 1) 919.921
- 2) 3986.33
- 3) -1379.88
- 4) 3833.
- 5) 1533.2

Exercise 2

Compute $\int_D (3x + 2y) \, dx \, dy$ for $D = \{0 \leq 4x + 6y \leq 7, 0 \leq 9x - 6y \leq 7\}$

- 1) 1.29668
- 2) 3.11203
- 3) 2.33402
- 4) -1.03734
- 5) -0.259336

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02-Multivariate integral-Hand exam for serial number: 4

Exercise 1

Compute the volume of $D = \{3(x^2 + y^2) \leq z \leq 16 - x^2 - y^2\}$

- 1) -20.1062
- 2) 10.0531
- 3) -10.0531
- 4) 100.531
- 5) -90.4779

Exercise 2

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

- 1) -0.723077
- 2) -0.323077
- 3) 0.576923
- 4) -0.323077
- 5) -0.123077

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02-Multivariate integral-Hand exam for serial number: 5

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 25, z \geq 11(x^2 + y^2)\}$

- 1) -2.12264
- 2) 3.53773
- 3) -1.76887
- 4) -1.76887
- 5) 1.76887

Exercise 2

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

- 1) -1.32
- 2) 0.08
- 3) 0.28
- 4) -1.72
- 5) -1.12

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02-Multivariate integral-Hand exam for serial number: 6

Exercise 1

Compute the volume of $D = \{13(x^2 + y^2) \leq z \leq 49 - x^2 - y^2\}$

- 1) 269.392
- 2) 404.087
- 3) -80.8175
- 4) 53.8783
- 5) 619.601

Exercise 2

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

- 1) 0.9
- 2) 1.8
- 3) -0.2
- 4) -0.3
- 5) 0.

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02-Multivariate integral-Hand exam for serial number: 7

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 196, z \geq 2(x^2 + y^2)\}$

- 1) 15.1222
- 2) 393.176
- 3) -105.855
- 4) 151.222
- 5) 181.466

Exercise 2

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

- 1) 0.372164
- 2) 1.77216
- 3) 0.972164
- 4) -0.827836
- 5) -1.22784

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02-Multivariate integral-Hand exam for serial number: 8

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 49, z \geq x^2 + y^2\}$

- 1) -28.6904
- 2) 121.934
- 3) 71.726
- 4) 143.452
- 5) 43.0356

Exercise 2

Compute $\int_D (x + 3y) \, dx \, dy$ for $D = \{0 \leq -2x - 9y \leq 3, 0 \leq -2x + 3y \leq 1\}$

- 1) -0.078125
- 2) -1.37813
- 3) 0.221875
- 4) 1.92188
- 5) -1.47813

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02-Multivariate integral-Hand exam for serial number: 9

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 4, z \geq 8\sqrt{x^2 + y^2}\}$

- 1) 1.22939
- 2) 1.12939
- 3) 1.82939
- 4) -0.970615
- 5) 0.129385

Exercise 2

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

- 1) 264.
- 2) 572.
- 3) 440.
- 4) 748.
- 5) 1144.

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02-Multivariate integral-Hand exam for serial number: 10

Exercise 1

Compute the volume of $D = \{10(x^2 + y^2) \leq z \leq 9 - x^2 - y^2\}$

- 1) 32.387
- 2) 16.1935
- 3) 27.7603
- 4) 13.8801
- 5) 11.5668

Exercise 2

Compute $\int_D (6y) \, dx \, dy$ for $D = \{0 \leq 9x + 9y \leq 4, 0 \leq -6x - 7y \leq 6\}$

- 1) -69.2333
- 2) -68.6333
- 3) -69.3333
- 4) -68.0333
- 5) -68.5333

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Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 100, z \geq 6\sqrt{x^2 + y^2}\}$

- 1) 79.7902
- 2) -25.6468
- 3) -8.54895
- 4) 28.4965
- 5) -2.84965

Exercise 2

Compute $\int_D (3x + 2y) \, dx \, dy$ for $D = \{0 \leq 3x + 8y \leq 6, 0 \leq 9x + 3y \leq 8\}$

- 1) -1.19728
- 2) -0.718367
- 3) 0.
- 4) 1.19728
- 5) 2.03537

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02-Multivariate integral-Hand exam for serial number: 12

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 25, z \geq 7\sqrt{x^2 + y^2}\}$

- 1) -0.789365
- 2) -2.63122
- 3) 5.52555
- 4) 2.63122
- 5) 0.263122

Exercise 2

Compute $\int_D (2x + 2y) \, dx \, dy$ for $D = \{0 \leq 6x + 3y \leq 6, 0 \leq 8x + 9y \leq 7\}$

- 1) -0.126
- 2) -1.134
- 3) -1.26
- 4) 1.386
- 5) 1.26

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02-Multivariate integral-Hand exam for serial number: 13

Exercise 1

Compute the volume of $D = \{15(x^2 + y^2) \leq z \leq 196 - x^2 - y^2\}$

- 1) 7165.82
- 2) 4902.93
- 3) 3771.48
- 4) -3017.19
- 5) 8297.26

Exercise 2

Compute $\int_D (3x + 2y) \, dx \, dy$ for $D = \{0 \leq 3x + 7y \leq 4, 0 \leq -5x - 6y \leq 2\}$

- 1) -0.558131
- 2) -1.55813
- 3) -0.858131
- 4) -0.258131
- 5) -0.558131

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02-Multivariate integral-Hand exam for serial number: 14

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 64, z \geq 11\sqrt{x^2 + y^2}\}$

- 1) 9.24806
- 2) -1.32115
- 3) 4.84422
- 4) 4.40384
- 5) -2.6423

Exercise 2

Compute $\int_D (3x) \, dx \, dy$ for $D = \{0 \leq 2x + y \leq 6, 0 \leq 6x - 9y \leq 5\}$

- 1) 4.60938
- 2) 6.45313
- 3) 1.84375
- 4) -0.460938
- 5) 6.91406

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02-Multivariate integral-Hand exam for serial number: 15

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 196, z \geq 5\sqrt{x^2 + y^2}\}$

- 1) 111.603
- 2) 290.168
- 3) -11.1603
- 4) 200.886
- 5) 145.084

Exercise 2

Compute $\int_D (5y) \, dx \, dy$ for $D = \{0 \leq 5x + y \leq 1, 0 \leq -2x - 7y \leq 8\}$

- 1) 0.52865
- 2) 0.42865
- 3) -0.0713499
- 4) -0.77135
- 5) -1.37135

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02-Multivariate integral-Hand exam for serial number: 16

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 169, z \geq 3\sqrt{x^2 + y^2}\}$

- 1) 259.741
- 2) 236.128
- 3) 70.8384
- 4) 495.869
- 5) -70.8384

Exercise 2

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

- 1) 0.072314
- 2) -1.32769
- 3) 0.772314
- 4) -1.22769
- 5) 1.17231

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Exercise 1

Compute the volume of $D = \{4(x^2 + y^2) \leq z \leq 169 - x^2 - y^2\}$

- 1) 26918.1
- 2) 6280.89
- 3) 16150.9
- 4) 8972.7
- 5) 2691.81

Exercise 2

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

- 1) -0.14375
- 2) -2.54375
- 3) -1.54375
- 4) -0.84375
- 5) 0.55625

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02-Multivariate integral-Hand exam for serial number: 18

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 196, z \geq 11\sqrt{x^2 + y^2}\}$

- 1) 30.6824
- 2) 23.6018
- 3) -16.5213
- 4) -23.6018
- 5) 40.1231

Exercise 2

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

- 1) -0.066482
- 2) 1.93352
- 3) 0.333518
- 4) -0.766482
- 5) -1.86648

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02-Multivariate integral-Hand exam for serial number: 19

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 64, z \geq x^2 + y^2\}$

- 1) 160.656
- 2) 94.5034
- 3) 47.2517
- 4) 264.61
- 5) 56.7021

Exercise 2

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

- 1) -15.5
- 2) -17.8
- 3) -16.
- 4) -16.2
- 5) -14.2

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02-Multivariate integral-Hand exam for serial number: 20

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 25, z \geq 7(x^2 + y^2)\}$

- 1) 10.5081
- 2) 5.5306
- 3) 4.97754
- 4) -0.55306
- 5) 8.29591

Exercise 2

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

- 1) -17.2625
- 2) -17.0625
- 3) -16.8625
- 4) -17.4625
- 5) -15.2625

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02-Multivariate integral-Hand exam for serial number: 21

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 169, z \geq \sqrt{x^2 + y^2}\}$

- 1) 1212.94
- 2) -943.4
- 3) 943.4
- 4) 1347.71
- 5) 4043.14

Exercise 2

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

- 1) -1.29668
- 2) -1.09668
- 3) 0.603316
- 4) 0.103316
- 5) -0.696684

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02-Multivariate integral-Hand exam for serial number: 22

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 81, z \geq 8\sqrt{x^2 + y^2}\}$

- 1) -1.17902
- 2) 1.17902
- 3) 7.07415
- 4) 12.9693
- 5) 11.7902

Exercise 2

Compute $\int_D (3x + 2y) \, dx \, dy$ for $D = \{0 \leq 6x + 6y \leq 1, 0 \leq y \leq 3\}$

- 1) -0.625
- 2) -1.725
- 3) -2.025
- 4) 1.375
- 5) -0.725

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02-Multivariate integral-Hand exam for serial number: 23

Exercise 1

Compute the volume of $D = \{5(x^2 + y^2) \leq z \leq 16 - x^2 - y^2\}$

- 1) 26.8083
- 2) 67.0206
- 3) 80.4248
- 4) 73.7227
- 5) 187.658

Exercise 2

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

- 1) 1.43141
- 2) 0.531413
- 3) -0.668587
- 4) 1.63141
- 5) -0.0685871

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02-Multivariate integral-Hand exam for serial number: 24

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 9, z \geq x^2 + y^2\}$

- 1) 14.4318
- 2) 12.0265
- 3) 8.41854
- 4) 22.8503
- 5) 22.8503

Exercise 2

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

- 1) -12.3563
- 2) -11.0563
- 3) -12.6563
- 4) -11.9563
- 5) -13.1563

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02-Multivariate integral-Hand exam for serial number: 25

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 9, z \geq 10(x^2 + y^2)\}$

- 1) -0.695207
- 2) 1.39041
- 3) 1.80754
- 4) -1.11233
- 5) 4.17124

Exercise 2

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

- 1) 0.764796
- 2) -1.9352
- 3) -2.8352
- 4) 0.364796
- 5) -1.1352

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02-Multivariate integral-Hand exam for serial number: 26

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 225, z \geq 12(x^2 + y^2)\}$

- 1) 82.2382
- 2) 5.87415
- 3) 29.3708
- 4) -17.6225
- 5) 8.81123

Exercise 2

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

- 1) 2.93333
- 2) -4.88889
- 3) 9.28889
- 4) 0.977778
- 5) 4.88889

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02-Multivariate integral-Hand exam for serial number: 27

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 36, z \geq 2(x^2 + y^2)\}$

- 1) 27.1285
- 2) 40.6927
- 3) 16.2771
- 4) -21.7028
- 5) 54.2569

Exercise 2

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

- 1) 0.540816
- 2) -0.359184
- 3) -1.65918
- 4) 1.14082
- 5) -2.15918

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02-Multivariate integral-Hand exam for serial number: 28

Exercise 1

Compute the volume of $D = \{8(x^2 + y^2) \leq z \leq 121 - x^2 - y^2\}$

- 1) 2555.34
- 2) 5110.67
- 3) 4344.07
- 4) 5366.21
- 5) 3577.47

Exercise 2

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

- 1) 5.17222
- 2) 6.53333
- 3) 2.72222
- 4) 6.53333
- 5) 4.62778

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02-Multivariate integral-Hand exam for serial number: 29

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 4, z \geq 9(x^2 + y^2)\}$

- 1) 0.0790945
- 2) 0.679095
- 3) 2.17909
- 4) 1.07909
- 5) 0.179095

Exercise 2

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

- 1) -0.10334
- 2) -1.90334
- 3) -0.60334
- 4) 1.79666
- 5) 0.0966604

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02-Multivariate integral-Hand exam for serial number: 30

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 16, z \geq 3\sqrt{x^2 + y^2}\}$

- 1) 19.26
- 2) -3.43928
- 3) 16.5085
- 4) 4.12713
- 5) 6.87856

Exercise 2

Compute $\int_D (x + 2y) \, dx \, dy$ for $D = \{0 \leq y \leq 4, 0 \leq -6x + 8y \leq 1\}$

- 1) -1.0513
- 2) -0.951303
- 3) 0.0486968
- 4) 1.6487
- 5) 1.2487

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02-Multivariate integral-Hand exam for serial number: 31

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 64, z \geq 12(x^2 + y^2)\}$

- 1) 17.5016
- 2) -4.16705
- 3) 8.3341
- 4) 16.6682
- 5) -5.83387

Exercise 2

Compute $\int_D (3x + 2y) \, dx \, dy$ for $D = \{0 \leq -6x + 7y \leq 4, 0 \leq y \leq 8\}$

- 1) -1.088
- 2) 3.62667
- 3) 8.704
- 4) 9.792
- 5) -3.264

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02-Multivariate integral-Hand exam for serial number: 32

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 36, z \geq 5\sqrt{x^2 + y^2}\}$

- 1) 8.7851
- 2) 25.4768
- 3) 24.5983
- 4) 14.9347
- 5) 23.7198

Exercise 2

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

- 1) 4.55625
- 2) 2.84766
- 3) 4.27148
- 4) 3.98672
- 5) 7.68867

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02-Multivariate integral-Hand exam for serial number: 33

Exercise 1

Compute the volume of $D = \{15(x^2 + y^2) \leq z \leq 100 - x^2 - y^2\}$

- 1) 2847.07
- 2) 981.748
- 3) 490.874
- 4) -981.748
- 5) 0.

Exercise 2

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

- 1) -16.875
- 2) -17.675
- 3) -18.875
- 4) -17.875
- 5) -16.775

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02-Multivariate integral-Hand exam for serial number: 34

Exercise 1

Compute the volume of $D = \{5(x^2 + y^2) \leq z \leq 64 - x^2 - y^2\}$

- 1) 2680.83
- 2) 3002.52
- 3) 536.165
- 4) 1072.33
- 5) -536.165

Exercise 2

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

- 1) 0.115621
- 2) 0.0156213
- 3) -0.284379
- 4) 1.71562
- 5) -0.184379

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02-Multivariate integral-Hand exam for serial number: 35

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 49, z \geq 12\sqrt{x^2 + y^2}\}$

- 1) 4.9629
- 2) 0.99258
- 3) 2.48145
- 4) 1.48887
- 5) 1.98516

Exercise 2

Compute $\int_D (3x + 2y) \, dx \, dy$ for $D = \{0 \leq -x - 6y \leq 9, 0 \leq 9x + 9y \leq 8\}$

- 1) 1.48622
- 2) 10.032
- 3) -2.22933
- 4) -2.60089
- 5) 3.71556

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02-Multivariate integral-Hand exam for serial number: 36

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 81, z \geq 5\sqrt{x^2 + y^2}\}$

- 1) 41.5096
- 2) 29.6497
- 3) 56.3344
- 4) 85.9841
- 5) 88.9491

Exercise 2

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

- 1) 1.25455
- 2) 0.454545
- 3) 0.154545
- 4) -0.545455
- 5) 0.954545

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02-Multivariate integral-Hand exam for serial number: 37

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 1, z \geq \sqrt{x^2 + y^2}\}$

- 1) -0.790886
- 2) 1.40911
- 3) 2.00911
- 4) 1.90911
- 5) 0.209114

Exercise 2

Compute $\int_D (3x + y) \, dx \, dy$ for $D = \{0 \leq -9x - 3y \leq 9, 0 \leq 8y \leq 6\}$

- 1) 0.075
- 2) -0.825
- 3) -1.125
- 4) -1.625
- 5) 0.375

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02-Multivariate integral-Hand exam for serial number: 38

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 9, z \geq \sqrt{x^2 + y^2}\}$

- 1) 1.09814
- 2) -0.329441
- 3) -0.549068
- 4) 3.07478
- 5) -0.549068

Exercise 2

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

- 1) 0.81
- 2) 2.01
- 3) -0.29
- 4) -1.19
- 5) -0.39

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 39

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 144, z \geq 10(x^2 + y^2)\}$

- 1) 33.7882
- 2) 22.5255
- 3) 0.
- 4) 42.7984
- 5) 60.8188

Exercise 2

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

- 1) -1.775
- 2) -2.075
- 3) -2.875
- 4) -3.975
- 5) -3.375

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 40

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 144, z \geq 8\sqrt{x^2 + y^2}\}$

- 1) -27.9473
- 2) 33.5367
- 3) 13.9736
- 4) 27.9473
- 5) 30.742

Exercise 2

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

- 1) 0.352184
- 2) -0.0478158
- 3) 0.352184
- 4) -1.34782
- 5) -1.94782

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 41

Exercise 1

Compute the volume of $D = \{x^2 + y^2 \leq z \leq 121 - x^2 - y^2\}$

- 1) 11 499.
- 2) -10 349.1
- 3) 27 597.6
- 4) 28 747.5
- 5) 21 848.1

Exercise 2

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

- 1) 0.627424
- 2) 0.527424
- 3) -1.47258
- 4) 0.427424
- 5) 0.127424

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 42

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 225, z \geq 8(x^2 + y^2)\}$

- 1) -8.79902
- 2) 96.7892
- 3) 4.39951
- 4) 43.9951
- 5) 26.397

Exercise 2

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

- 1) -2.38989
- 2) -1.28989
- 3) -0.989887
- 4) -2.18989
- 5) 0.410113

Further Mathematics - Degree in Engineering - 2024/2025 02-Multivariate integral-Hand exam for serial number: 43

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 16, z \geq 2\sqrt{x^2 + y^2}\}$

- 1) 2.83022
- 2) -4.24533
- 3) 16.9813
- 4) 5.66045
- 5) 14.1511

Exercise 2

Compute $\int_D (5x) \, dx \, dy$ for $D = \{0 \leq 3x + 5y \leq 5, 0 \leq -9x + 2y \leq 6\}$

- 1) 0.923299
- 2) -2.5767
- 3) -0.576701
- 4) -2.2767
- 5) -2.0767

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 44

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 4, z \geq \sqrt{x^2 + y^2}\}$

- 1) 1.56629
- 2) 1.46629
- 3) 1.06629
- 4) 0.866294
- 5) 1.96629

Exercise 2

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

- 1) 0.0416419
- 2) 1.94164
- 3) 0.141642
- 4) 0.641642
- 5) 0.141642

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 45

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 49, z \geq 7\sqrt{x^2 + y^2}\}$

- 1) 17.3281
- 2) 12.9961
- 3) 7.22006
- 4) 14.4401
- 5) 20.2162

Exercise 2

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

- 1) 48.0375
- 2) 34.3125
- 3) 41.175
- 4) 68.625
- 5) 51.4688

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 46

Exercise 1

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

- 1) -25.6976
- 2) 32.1219
- 3) 28.9097
- 4) 80.3049
- 5) 19.2732

Exercise 2

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

- 1) -0.66642
- 2) -1.36642
- 3) -0.16642
- 4) 0.63358
- 5) -1.46642

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 47

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 169, z \geq 15(x^2 + y^2)\}$

- 1) 33.5394
- 2) 51.1918
- 3) 17.6523
- 4) -3.53047
- 5) -1.76523

Exercise 2

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

- 1) 828.
- 2) 82.8
- 3) 1490.4
- 4) 165.6
- 5) 1490.4

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 48

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 16, z \geq \sqrt{x^2 + y^2}\}$

- 1) 90.2975
- 2) -19.6299
- 3) -39.2598
- 4) 106.001
- 5) 39.2598

Exercise 2

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

- 1) 0.734694
- 2) 0.634694
- 3) 2.13469
- 4) 0.134694
- 5) 2.63469

Further Mathematics - Degree in Engineering - 2024/2025 02-Multivariate integral-Hand exam for serial number: 49

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 121, z \geq 9(x^2 + y^2)\}$

- 1) -8.40487
- 2) 46.2268
- 3) 21.0122
- 4) 58.8341
- 5) 39.9231

Exercise 2

Compute $\int_D (3x + y) \, dx \, dy$ for $D = \{0 \leq -4x - y \leq 1, 0 \leq 2x + 4y \leq 3\}$

- 1) 1.84643
- 2) 0.946429
- 3) -0.0535714
- 4) 1.24643
- 5) -2.05357

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 50

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 225, z \geq 8\sqrt{x^2 + y^2}\}$

- 1) -27.2922
- 2) 98.2521
- 3) 60.0429
- 4) 54.5845
- 5) 152.837

Exercise 2

Compute $\int_D (3y) \, dx \, dy$ for $D = \{0 \leq x - 6y \leq 1, 0 \leq 5x - 8y \leq 3\}$

- 1) 1.11944
- 2) 1.71944
- 3) -0.980556
- 4) -0.180556
- 5) 1.81944

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 51

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 100, z \geq 8(x^2 + y^2)\}$

- 1) 50.7331
- 2) 54.6357
- 3) 1.95127
- 4) 19.5127
- 5) 29.2691

Exercise 2

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

- 1) -1.40204
- 2) -2.00204
- 3) -3.10204
- 4) -2.70204
- 5) -4.80204

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 52

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 25, z \geq 6(x^2 + y^2)\}$

- 1) 6.43711
- 2) 10.9431
- 3) 13.5179
- 4) 3.21855
- 5) -5.14968

Exercise 2

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

- 1) -3.1
- 2) -4.
- 3) -5.6
- 4) -4.4
- 5) -2.6

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 53

Exercise 1

Compute the volume of $D = \{13(x^2 + y^2) \leq z \leq 121 - x^2 - y^2\}$

- 1) -1478.44
- 2) 164.272
- 3) 1642.72
- 4) 1806.99
- 5) 2135.53

Exercise 2

Compute $\int_D (4x) \, dx \, dy$ for $D = \{0 \leq -5x + 7y \leq 2, 0 \leq -5x - 9y \leq 1\}$

- 1) -0.615625
- 2) -2.01563
- 3) 1.88438
- 4) -0.015625
- 5) 1.98438

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 54

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 81, z \geq 7\sqrt{x^2 + y^2}\}$

- 1) -3.06905
- 2) 15.3453
- 3) 9.20715
- 4) -1.77636×10^{-15}
- 5) 13.8107

Exercise 2

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

- 1) 3.5
- 2) 35.
- 3) -3.5
- 4) -24.5
- 5) 24.5

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 55

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 81, z \geq 14(x^2 + y^2)\}$

- 1) 13.5783
- 2) 9.05221
- 3) 19.0096
- 4) 7.24177
- 5) 14.4835

Exercise 2

Compute $\int_D (3x + 2y) \, dx \, dy$ for $D = \{0 \leq -5x + 4y \leq 6, 0 \leq -4x - 8y \leq 3\}$

- 1) -0.0649235
- 2) 1.23508
- 3) -0.564923
- 4) 0.435077
- 5) -0.464923

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 56

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 9, z \geq 8\sqrt{x^2 + y^2}\}$

- 1) 1.83668
- 2) -0.163324
- 3) 1.23668
- 4) 0.436676
- 5) 1.93668

Exercise 2

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

- 1) -19.55
- 2) -18.25
- 3) -19.45
- 4) -20.45
- 5) -20.25

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 57

Exercise 1

Compute the volume of $D = \{4(x^2 + y^2) \leq z \leq 16 - x^2 - y^2\}$

- 1) -32.1699
- 2) 88.4672
- 3) 96.5097
- 4) 225.189
- 5) 80.4248

Exercise 2

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

- 1) -0.507143
- 2) -1.40714
- 3) 1.29286
- 4) -0.607143
- 5) 0.292857

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 58

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 9, z \geq 3(x^2 + y^2)\}$

- 1) 7.58214
- 2) 0.892017
- 3) 9.81218
- 4) 12.0422
- 5) 4.46008

Exercise 2

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

- 1) 0.976731
- 2) -0.623269
- 3) -0.823269
- 4) 0.976731
- 5) 0.776731

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 59

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 81, z \geq 9(x^2 + y^2)\}$

- 1) -9.83518
- 2) 11.2402
- 3) 7.02513
- 4) 14.0503
- 5) 42.1508

Exercise 2

Compute $\int_D (4x) \, dx \, dy$ for $D = \{0 \leq -5x - y \leq 2, 0 \leq -8x + 7y \leq 1\}$

- 1) 0.06755
- 2) -1.03245
- 3) -0.03245
- 4) -1.43245
- 5) -1.43245

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 60

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 49, z \geq 11(x^2 + y^2)\}$

- 1) 8.34233
- 2) -4.17117
- 3) 17.3799
- 4) 18.0751
- 5) 6.95194

Exercise 2

Compute $\int_D (4x) \, dx \, dy$ for $D = \{0 \leq -6x + y \leq 8, 0 \leq 6x + 5y \leq 4\}$

- 1) -0.0777778
- 2) -1.77778
- 3) 0.222222
- 4) -3.17778
- 5) -0.977778

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 61

Exercise 1

Compute the volume of $D = \{8(x^2 + y^2) \leq z \leq 1 - x^2 - y^2\}$

- 1) -1.52547
- 2) 1.67453
- 3) 0.174533
- 4) -1.12547
- 5) -0.225467

Exercise 2

Compute $\int_D (5y) \, dx \, dy$ for $D = \{0 \leq 7x - 2y \leq 1, 0 \leq 5x - 6y \leq 9\}$

- 1) -2.47441
- 2) -1.27441
- 3) -2.37441
- 4) -0.174414
- 5) -2.27441

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 62

Exercise 1

Compute the volume of $D = \{9(x^2 + y^2) \leq z \leq 64 - x^2 - y^2\}$

- 1) 128.68
- 2) 643.398
- 3) 257.359
- 4) 128.68
- 5) 1415.48

Exercise 2

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

- 1) 0.0888889
- 2) 0.388889
- 3) 0.888889
- 4) -0.211111
- 5) -1.11111

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 63

Exercise 1

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

- 1) 4.02124
- 2) 15.0796
- 3) 4.02124
- 4) 14.577
- 5) 5.02655

Exercise 2

Compute $\int_D (2y) \, dx \, dy$ for $D = \{0 \leq 7x - 8y \leq 1, 0 \leq 9x - 8y \leq 9\}$

- 1) 0.
- 2) 1.70859
- 3) 1.89844
- 4) 2.65781
- 5) 2.65781

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 64

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 196, z \geq 14 \sqrt{x^2 + y^2}\}$

- 1) 26.2888
- 2) 13.1444
- 3) 14.6049
- 4) 37.9727
- 5) 11.6839

Exercise 2

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

- 1) 1.71889
- 2) -0.505556
- 3) 1.61778
- 4) 1.01111
- 5) 0.101111

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 65

Exercise 1

Compute the volume of $D = \{15(x^2 + y^2) \leq z \leq 121 - x^2 - y^2\}$

- 1) 1437.38
- 2) -431.213
- 3) 3162.23
- 4) 3162.23
- 5) 1006.16

Exercise 2

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

- 1) 3.63636
- 2) -3.30579
- 3) 2.64463
- 4) 3.30579
- 5) 9.91736

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 66

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 4, z \geq \sqrt{x^2 + y^2}\}$

- 1) 0.849353
- 2) -1.75065
- 3) 0.0493526
- 4) 0.649353
- 5) 0.749353

Exercise 2

Compute $\int_D (4y) \, dx \, dy$ for $D = \{0 \leq -x + y \leq 7, 0 \leq 6x + 2y \leq 9\}$

- 1) 100.406
- 2) 160.65
- 3) 210.853
- 4) 251.016
- 5) -30.1219

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 67

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 16, z \geq 7(x^2 + y^2)\}$

- 1) 3.52704
- 2) 6.70137
- 3) 5.99596
- 4) 7.40677
- 5) -1.05811

Exercise 2

Compute $\int_D (4x) dx dy$ for $D = \{0 \leq -8x + y \leq 1, 0 \leq -3x + 3y \leq 2\}$

- 1) -0.00907029
- 2) -1.10907
- 3) 0.0909297
- 4) 1.49093
- 5) 0.39093

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 68

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 121, z \geq 10(x^2 + y^2)\}$

- 1) -5.67615
- 2) -5.67615
- 3) 13.2444
- 4) 30.2728
- 5) 18.9205

Exercise 2

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

- 1) -34.8379
- 2) -34.0379
- 3) -34.6379
- 4) -33.4379
- 5) -33.8379

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 69

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 81, z \geq 6\sqrt{x^2 + y^2}\}$

- 1) 8.30958
- 2) -20.7739
- 3) -12.4644
- 4) 62.3218
- 5) 20.7739

Exercise 2

Compute $\int_D (4y) \, dx \, dy$ for $D = \{0 \leq 3x - 4y \leq 8, 0 \leq 6x - 4y \leq 1\}$

- 1) -5.9
- 2) -7.
- 3) -5.
- 4) -3.
- 5) -6.3

Further Mathematics - Degree in Engineering - 2024/2025
02-Multivariate integral-Hand exam for serial number: 70

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 36, z \geq 13(x^2 + y^2)\}$

- 1) -0.864426
- 2) 0.432213
- 3) 10.3731
- 4) 4.32213
- 5) $0.$

Exercise 2

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

- 1) -3.85102
- 2) -1.55102
- 3) -2.85102
- 4) -2.55102
- 5) -3.55102

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 71

Exercise 1

Compute the volume of $D = \{15(x^2 + y^2) \leq z \leq 100 - x^2 - y^2\}$

- 1) 196.35
- 2) 2061.67
- 3) 981.748
- 4) 2945.24
- 5) 1767.15

Exercise 2

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

- 1) -1.676
- 2) -2.976
- 3) -2.276
- 4) -3.576
- 5) -4.176

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 72

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 225, z \geq 14\sqrt{x^2 + y^2}\}$

- 1) -14.3707
- 2) 32.3341
- 3) -7.18536
- 4) 28.7414
- 5) 17.9634

Exercise 2

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

- 1) -0.925
- 2) 1.075
- 3) 0.375
- 4) 1.975
- 5) -0.825

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 73

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 225, z \geq \sqrt{x^2 + y^2}\}$

- 1) 414.068
- 2) -1449.24
- 3) 3933.65
- 4) -1449.24
- 5) 2070.34

Exercise 2

Compute $\int_D (5x) \, dx \, dy$ for $D = \{0 \leq 6x - 9y \leq 1, 0 \leq 7x - 2y \leq 4\}$

- 1) -1.36928
- 2) -0.469281
- 3) -1.76928
- 4) 1.03072
- 5) 0.130719

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 74

Exercise 1

Compute the volume of $D = \{4(x^2 + y^2) \leq z \leq 144 - x^2 - y^2\}$

- 1) -6514.41
- 2) 1302.88
- 3) 13 680.3
- 4) 6514.41
- 5) 5211.53

Exercise 2

Compute $\int_D (4y) \, dx \, dy$ for $D = \{0 \leq x - 8y \leq 5, 0 \leq -2x \leq 1\}$

- 1) -0.429688
- 2) 0.770313
- 3) -2.42969
- 4) -0.629688
- 5) -2.22969

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 75

Exercise 1

Compute the volume of $D = \{13(x^2 + y^2) \leq z \leq 225 - x^2 - y^2\}$

- 1) -5112.1
- 2) -3408.07
- 3) 9088.18
- 4) 8520.17
- 5) 5680.11

Exercise 2

Compute $\int_D (2x + 3y) \, dx \, dy$ for $D = \{0 \leq 3x + 9y \leq 5, 0 \leq -5x - 4y \leq 6\}$

- 1) -1.56171
- 2) 0.738292
- 3) -2.26171
- 4) 0.938292
- 5) -0.261708

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 76

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 64, z \geq 15(x^2 + y^2)\}$

- 1) -6.67422
- 2) -3.33711
- 3) 0.
- 4) 6.67422
- 5) 8.00906

Exercise 2

Compute $\int_D (3x + y) \, dx \, dy$ for $D = \{0 \leq 4x - y \leq 2, 0 \leq 3x + 8y \leq 1\}$

- 1) -1.96
- 2) 1.84
- 3) 0.04
- 4) -0.06
- 5) -1.86

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 77

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 81, z \geq 6(x^2 + y^2)\}$

- 1) 8.40424
- 2) 27.3138
- 3) 21.0106
- 4) 56.7286
- 5) 50.4255

Exercise 2

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

- 1) 0.622722
- 2) -0.777278
- 3) 0.522722
- 4) 0.022722
- 5) -0.077278

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 78

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 225, z \geq 4\sqrt{x^2 + y^2}\}$

- 1) 211.05
- 2) -84.4201
- 3) -211.05
- 4) 316.575
- 5) 464.311

Exercise 2

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

- 1) -25.2
- 2) -26.2
- 3) -23.6
- 4) -26.3
- 5) -23.4

Further Mathematics - Degree in Engineering - 2024/2025 02-Multivariate integral-Hand exam for serial number: 79

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 1, z \geq 4\sqrt{x^2 + y^2}\}$

- 1) 1.96253
- 2) 0.862533
- 3) 0.0625334
- 4) 0.462533
- 5) 1.26253

Exercise 2

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

- 1) -8.25
- 2) -8.75
- 3) -6.95
- 4) -7.95
- 5) -8.15

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 80

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 196, z \geq 9(x^2 + y^2)\}$

- 1) 88.59
- 2) -13.6292
- 3) 34.0731
- 4) 17.0365
- 5) 61.3315

Exercise 2

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

- 1) -0.4
- 2) 2.
- 3) 3.8
- 4) 5.2
- 5) 1.4

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 81

Exercise 1

Compute the volume of $D = \{10(x^2 + y^2) \leq z \leq 196 - x^2 - y^2\}$

- 1) 3840.05
- 2) -3840.05
- 3) -548.579
- 4) 7131.53
- 5) 5485.79

Exercise 2

Compute $\int_D (2x + 3y) \, dx \, dy$ for $D = \{0 \leq 3x - 7y \leq 6, 0 \leq 7x - 4y \leq 9\}$

- 1) -0.94916
- 2) -1.04916
- 3) 0.65084
- 4) 0.55084
- 5) 1.65084

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 82

Exercise 1

Compute the volume of $D = \{11(x^2 + y^2) \leq z \leq 36 - x^2 - y^2\}$

- 1) 373.221
- 2) 458.044
- 3) 16.9646
- 4) 220.54
- 5) 169.646

Exercise 2

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

- 1) 0.275
- 2) 0.075
- 3) 0.475
- 4) 0.975
- 5) -0.725

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 83

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 1, z \geq 9(x^2 + y^2)\}$

- 1) 1.36519
- 2) -0.0348117
- 3) 0.165188
- 4) -1.43481
- 5) 1.16519

Exercise 2

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

- 1) -1.56735
- 2) 1.56735
- 3) 2.19429
- 4) 4.38857
- 5) 1.25388

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 84

Exercise 1

Compute the volume of $D = \{4(x^2 + y^2) \leq z \leq 121 - x^2 - y^2\}$

- 1) 5519.53
- 2) 1839.84
- 3) -1839.84
- 4) 4599.61
- 5) 8279.29

Exercise 2

Compute $\int_D (2x + 3y) \, dx \, dy$ for $D = \{0 \leq -6x - 8y \leq 4, 0 \leq -4x - 2y \leq 5\}$

- 1) -1.65
- 2) 0.45
- 3) -0.55
- 4) -1.95
- 5) 0.35

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 85

Exercise 1

Compute the volume of $D = \{10(x^2 + y^2) \leq z \leq 4 - x^2 - y^2\}$

- 1) 6.6259
- 2) 3.88415
- 3) 2.28479
- 4) -1.1424
- 5) 1.82784

Exercise 2

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

- 1) -2.49917
- 2) -4.09917
- 3) -5.09917
- 4) -3.19917
- 5) -5.69917

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 86

Exercise 1

Compute the volume of $D = \{7(x^2 + y^2) \leq z \leq 100 - x^2 - y^2\}$

- 1) 5301.44
- 2) 5105.09
- 3) 3730.64
- 4) 2552.54
- 5) 1963.5

Exercise 2

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

- 1) 1.20816
- 2) 0.808163
- 3) 1.70816
- 4) 1.40816
- 5) 2.30816

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 87

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 25, z \geq 12\sqrt{x^2 + y^2}\}$

- 1) 2.30432
- 2) -0.495682
- 3) 0.904318
- 4) 1.20432
- 5) 1.00432

Exercise 2

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

- 1) 1.59862
- 2) 0.319723
- 3) 1.91834
- 4) 2.87751
- 5) 4.63599

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 88

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 100, z \geq 12(x^2 + y^2)\}$

- 1) 0.
- 2) 13.0356
- 3) 36.4996
- 4) 24.7676
- 5) 36.4996

Exercise 2

Compute $\int_D (4y) \, dx \, dy$ for $D = \{0 \leq -5x - y \leq 6, 0 \leq 8x \leq 7\}$

- 1) -107.038
- 2) -108.338
- 3) -110.238
- 4) -107.438
- 5) -108.938

Further Mathematics - Degree in Engineering - 2024/2025 02-Multivariate integral-Hand exam for serial number: 89

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 4, z \geq \sqrt{x^2 + y^2}\}$

- 1) -1.35065
- 2) -1.65065
- 3) 0.849353
- 4) 0.0493526
- 5) -0.250647

Exercise 2

Compute $\int_D (6y) \, dx \, dy$ for $D = \{0 \leq -x + 4y \leq 8, 0 \leq -7x + 7y \leq 5\}$

- 1) -12.4898
- 2) -5.55102
- 3) 13.8776
- 4) -2.77551
- 5) 26.3673

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 90

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 225, z \geq 15 \sqrt{x^2 + y^2}\}$

- 1) -3.13116
- 2) 15.6558
- 3) 39.1395
- 4) 18.787
- 5) -12.5246

Exercise 2

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

- 1) 2.7
- 2) -0.81
- 3) 7.83
- 4) 6.48
- 5) -0.54

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 91

Exercise 1

Compute the volume of $D = \{2(x^2 + y^2) \leq z \leq 169 - x^2 - y^2\}$

- 1) 4486.35
- 2) 14954.5
- 3) 13459.1
- 4) 44863.5
- 5) 40377.2

Exercise 2

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

- 1) -0.545682
- 2) 1.45432
- 3) -0.145682
- 4) 0.954318
- 5) -1.24568

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 92

Exercise 1

Compute the volume of $D = \{10(x^2 + y^2) \leq z \leq 196 - x^2 - y^2\}$

- 1) -1645.74
- 2) -4388.63
- 3) 7131.53
- 4) -3291.48
- 5) 5485.79

Exercise 2

Compute $\int_D (5y) \, dx \, dy$ for $D = \{0 \leq -7x + 3y \leq 4, 0 \leq 6x + 8y \leq 9\}$

- 1) -0.285975
- 2) 1.42988
- 3) 2.2878
- 4) -0.142988
- 5) 1.28689

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 93

Exercise 1

Compute the volume of $D = \{3(x^2 + y^2) \leq z \leq 100 - x^2 - y^2\}$

- 1) 3534.29
- 2) -1570.8
- 3) 8639.38
- 4) 3926.99
- 5) 10995.6

Exercise 2

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

- 1) -1.13216
- 2) 0.267836
- 3) -0.0321638
- 4) 0.367836
- 5) 0.667836

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 94

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 25, z \geq 3\sqrt{x^2 + y^2}\}$

- 1) 13.4347
- 2) 9.40428
- 3) 14.7781
- 4) 1.34347
- 5) 38.9606

Exercise 2

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

- 1) -1.78125
- 2) -0.28125
- 3) 0.61875
- 4) 0.81875
- 5) -0.88125

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 95

Exercise 1

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

- 1) 51.0085
- 2) 56.1093
- 3) 153.025
- 4) 137.723
- 5) -45.9076

Exercise 2

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

- 1) -0.09
- 2) 1.01
- 3) -1.29
- 4) 0.01
- 5) 0.01

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02-Multivariate integral-Hand exam for serial number: 96

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 16, z \geq x^2 + y^2\}$

- 1) 26.6888
- 2) 22.2407
- 3) 17.7926
- 4) 46.7055
- 5) 46.7055

Exercise 2

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

- 1) -1.38089
- 2) -0.580886
- 3) -3.28089
- 4) -1.88089
- 5) -0.980886

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 97

Exercise 1

Compute the volume of $D = \{14(x^2 + y^2) \leq z \leq 49 - x^2 - y^2\}$

- 1) 502.864
- 2) 50.2864
- 3) 75.4296
- 4) -150.859
- 5) 251.432

Exercise 2

Compute $\int_D (5y) \, dx \, dy$ for $D = \{0 \leq 2x + 4y \leq 8, 0 \leq 8y \leq 6\}$

- 1) 15.1875
- 2) -2.25
- 3) 5.625
- 4) -3.9375
- 5) -0.5625

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 98

Exercise 1

Compute the volume of $D = \{11(x^2 + y^2) \leq z \leq 1 - x^2 - y^2\}$

- 1) 0.9309
- 2) 1.0309
- 3) 0.6309
- 4) 0.1309
- 5) 1.8309

Exercise 2

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

- 1) -2419.1
- 2) -2419.3
- 3) -2419.2
- 4) -2420.3
- 5) -2421.

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 99

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 16, z \geq 11\sqrt{x^2 + y^2}\}$

- 1) 2.15048
- 2) -1.34952
- 3) 0.55048
- 4) 1.85048
- 5) 0.45048

Exercise 2

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

- 1) 1.00123
- 2) -1.89877
- 3) -0.0987654
- 4) -1.39877
- 5) 0.301235

Further Mathematics - Degree in Engineering - 2024/2025

02-Multivariate integral-Hand exam for serial number: 100

Exercise 1

Compute the volume of $D = \{x^2 + y^2 + z^2 \leq 64, z \geq 12\sqrt{x^2 + y^2}\}$

- 1) 3.70409
- 2) 4.0745
- 3) -0.740818
- 4) 10.7419
- 5) -3.70409

Exercise 2

Compute $\int_D (4y) \, dx \, dy$ for $D = \{0 \leq 2x + 9y \leq 4, 0 \leq 2x - 9y \leq 1\}$

- 1) 1.03704
- 2) 0.837037
- 3) -0.562963
- 4) 0.037037
- 5) -1.96296