

After the exam of 08.09.2015: Typical errors, comments etc.

QUESTION 1

ERROR: the hint is used but not proved.

PENALTY: 25 points.

COMMENT: the volume of the set $E_a = \{(x, y, z) : x^2 + y^4 + z^6 \leq a\}$ is proportional to $a^{11/12}$, since the *linear* transformation $T_a : (x, y, z) \mapsto (a^{1/2}x, a^{1/4}y, a^{1/6}z)$ satisfies $T_a(E_1) = E_a$ and $\det T_a = a^{11/12}$.

Alternatively, you may obtain E_a from a ball by a *nonlinear* transformation, and use spherical coordinates (on the ball), but this way is longer.

QUESTION 2

ERROR: the square root (of the Gram determinant) is forgotten.

PENALTY: 7 points.

QUESTION 3

ERROR: the surface of a sphere is proportional to r^n (rather than r^{n-1}).

PENALTY: 7 points.

ERROR: the unit normal vector (to a sphere) is x (rather than $\frac{x}{|x|}$).

PENALTY: 7 points.

GRADES STATISTICS

Total	Question 1	Question 2	Question 3	Question 4
100		35	35	30
98	35	35	28	
91	28	35	28	
86		35	28	23
75		35	10	30
73	10	35	28	
65	10	35		20
63		35	28	
60		35	10	15
50	0	35		15
45	0	35	10	
45		18	10	17
33	0	18	15	
28	0	28	0	
18	0	18	0	