Grundkurs Mathematik S1	Extraaufgaben Nr. 2 Lösungen		2004-2005

Abzugeben <u>in handschriftlicher Form</u> bis zum <u>7.12. 2004</u> bei Su
Es werden nur Lösungen mit den entsprechenden Nebenrechnungen (Extrazettel!) akzeptiert!

	Ableitungsfunktion f'	Funktion f	Stammfunktion F	
1	$f'(x) = 108(5-3x)^2$	$f(x) = -12(5-3x)^3$	$F(x) = (5-3x)^4 + C$	4
2	$f'(x) = \dfrac{-12(2x-1)^2 + 96x^2(2x^2-1)}{(2x^2-1)^4}$	$f(x) = \dfrac{-12x}{(2x^2-1)^2}$	$F(x) = \dfrac{3}{2x^2-1} + C$	4
3	$f'(x) = \dfrac{\sqrt{x^2+1} - \dfrac{x^2}{\sqrt{x^2+1}}}{x^2+1}$	$f(x) = \dfrac{x}{\sqrt{x^2+1}}$	$F(x) = \sqrt{x^2+1} + C$	4
4	$f'(x) = -4\sin(2x-\pi)$	$f(x) = 2\cos(2x-\pi)$	$F(x) = \sin(2x-\pi) + C$	4
5	$f'(x) = -2\cos(1-x)$	$f(x) = 2\sin(1-x)$	$F(x) = 2\cos(1-x) + C$	4
6	$f'(x) = -\sin(2x+1)$	$f(x) = \dfrac{1}{2}\cos(2x+1)$	$F(x) = \dfrac{1}{4}\sin(2x+1) + C$	4
7	$f'(x) = \dfrac{3}{2\sqrt{3x+2}} + \dfrac{3\sqrt{3x+2} - \dfrac{9x}{\sqrt{3x+2}}}{12x+8}$	$f(x) = \sqrt{3x+2} + \dfrac{3x}{2\sqrt{3x+2}}$	$F(x) = x\sqrt{3x+2} + C$	4
8	$f'(x) = 6x\sqrt{x} + \dfrac{3x^2}{\sqrt{x}} - \dfrac{x^3+1}{4\sqrt{x^3}}$	$f(x) = 3x^2\sqrt{x} + (x^3+1)\dfrac{1}{2\sqrt{x}}$	$F(x) = (x^3+1)\sqrt{x} + C$	4
9	$f'(x) = -\dfrac{2(x^2+2)^2 - 8x^2(x^2+2)}{(x^2+2)^4}$	$f(x) = -\dfrac{2x}{(x^2+2)^2}$	$F(x) = \dfrac{1}{x^2+2} + C$	4
10	$f'(x) = \dfrac{4x^5 + 4x^3}{x^8}$	$f(x) = \dfrac{-2x^2-1}{x^4}$	$F(x) = \dfrac{2x+1}{x^2} + C$	4
11	$f'(x) = \dfrac{-x^3\sin x - 2x^2\cos x + 2x\sin x}{x^4}$	$f(x) = \dfrac{x\cos x - \sin x}{x^2}$	$F(x) = \dfrac{\sin x}{x} + C$	4
12	$f'(x) = \dfrac{-2x(x+1)^2 - 4(-x^2+1)(x+1)^3}{(x+1)^8}$	$f(x) = \dfrac{-x^2+1}{(x+1)^4}$	$F(x) = \dfrac{x}{(x+1)^2} + C$	4
13	$f'(x) = 2nx^{2n-1}$	$f(x) = x^{2n}$	$F(x) = \dfrac{x^{2n+1}}{2n+1} + C$	4
14	$f'(x) = \dfrac{-2-n}{2}x^{-3-n}$	$f(x) = \dfrac{1}{2}x^{-2-n}$	$F(x) = \dfrac{1}{2}\dfrac{x^{-1-n}}{-1-n}$	4

15	$f'(x) = \dfrac{-3(-n+1)}{2} x^{-n} = \dfrac{3n-3}{2x^n}$	$f(x) = -\dfrac{3}{2x^{n-1}}$	$F(X) = -\dfrac{3}{2} \dfrac{x^{-n+2}}{(-n+2)}$	4
16	$f'(x) = -2\sin x + \cos x$	$f(x) = 2\cos x + \sin x$	$F(x) = 2\sin x - \cos x + C$	4
17	$f'(x) = \dfrac{-24}{x^3}$	$f(x) = -(-\dfrac{6}{x^2}) - \dfrac{6}{-x^2}$	$F(x) = -\dfrac{12}{x} + C$	4
			Summe	68
			Note	

Bewertungsschema Extraaufgabe 2:

68	1+
67	
66	
65	1
64	
63	
62	1-
61	
60	
59	2+
58	
57	
56	2
55	
54	
53	2-
52	
51	
50	3+
49	
48	
47	3
46	
45	
44	3-
43	
42	
41	4+
40	
39	
38	4
37	
36	
35	4-
34	
33	
32	
31	5+
30	
29	
28	5
27	
26	

25   5-
24
23
22   6
21
20
19
18
17