

Homework Assignments for Math 365

Due dates will be announced in class. Short answer problems always require brief explanation.

Section	Topic	Hand In
1.1.2	Norm	p 5 # 3, 4b
1.1.3	Domains	p 9 # 1, 6
1.1.4	Boundedness	p 11 # 1, 2, 3
1.2.1	Parametrizations	p 18 # 2, 3, 4
1.2.2	Length	p 19 # 2
1.2.3	Parametrization by arc length	p 22 # 2
1.2.4	Jordan Curves	p 25 # 1, 4
1.2.5	Dot product	p 27 # 2, 3, 4
1.2.6	Outward normal vector	p 29 # 2
1.3.1	C^1	p 34 # 1, 2
1.3.2	Directional derivative	p 38 # 1bcf, 2
1.3.3	Gradient vector	p 41 # 1ac
1.3.4	Outward normal derivative	p 43 # 2, 3, 5, 6c, look at but not turn in 7
1.3.5	Laplacian	p 45 # 1 (show work)
1.4.1	Line integrals	p 49 # 1b, 2a, 3, 4, *5 (important), 6
1.4.2	Double integrals	p 53 # 1b, 6, think about 2
1.4.3	Green's Theorem	p 58 # 1, 2, 8ab (justify)
1.4.4	Green's identity	p 66 # 1, 3
2.1	Harmonic functions	p 70 # 1, 3, 8
2.2.1	Steady state temperature	p 72 # 2, 5, 8 (heat equation is important!)
2.2.2	Characterization of H.F.	p 76 # 2, think about 1
3.1.1	Complex number definition	p 104 Be sure you can do all probs. Do not hand in.
3.1.2	Complex plane	p 105 Be sure you can do all probs. Do not hand in.
3.1.3	Division	p 106 Be sure you can do all probs. Do not hand in.
3.2.1	Functions & continuity	p 110 # 1, 2, 3, 9 (you may use # 8 without proving it)
3.2.2	Derivative	p 113 # 1ab from def, 2
3.2.3	Analyticity	p 114 # 1b, 2, 10 (use C-R), look at 14
3.3	Cauchy-Riemann	p 119 # 1, 4, 5, 6, 7
3.4.1	exp	p 126 # 10, 11
3.4.2	log	p 135 # 1bc, 2bc, 3, 4, 5, 6
3.4.3	Trig functions	p 137 # 1, 2, 3, 6a, 9, 10, 11 (show where sample vertical lines / horizontal lines / points go. use colors!)
3.4.4	Complex exponents	p 139 # 1
3.5	Harmonic Conjecture	p 141 # 1

Section	Topic	Hand In
4.1.1	Complex line integral	p 150 # 1, 2
4.1.2	FTC	p 155 # 2, 3, 6
4.1.3	ML-inequality	p 158 # 1, 2
4.2	Cauchy Integral Theorem	p 166 # 1, 2, 3, 4, 6
4.3	Cauchy Integral Formula	p 171 # 1cde, 4
4.7	Maximum Modulus	p 184 # 2a using ideas from this section
4.9	Liouville's Theorem	p 188 # 4
4.10	Morera's Theorem	p 190 # 1
5.1.2	Complex Series	p 199 # 1, 2
5.1.3	Absolute Convergence	p 200 # 1, 2, 3
5.1.4	Properties of series	p 201 # 1, 2, 3
5.2.1	Disc of convergence	p 207 # 1, 2, 3, 9, 10, look at 12
5.3.1	Power series coefficients	p 220 # 1cdf, 2
5.3.2	Taylor expansion	p 223 # 1, 2 (recall: short answers require brief explanations)
5.3.3	Finding Taylor series	p 229 # 1def
6.1.1	Types of singularities	p 238 # 3 (prove (a) as well), look at # 1, 4
6.1.2	Removable singularities	p 242 # 1, 4
6.2.1	Laurent expansion	p 247 # 1, 2, 3
6.2.2	Computing Laurent series	p 250 # 1, 2, 3
6.3	Poles	p 255 # 1, 2, 4
6.4	Essential singularities	p 258 # 5, 6, 7, look at 1, 2, 3
7.1.1	Residue Theorem	p 265 # 1 (do, or point out ones you can't do yet), 2, 4, 5
7.1.2	Computing residues	p 268 # 1, 2, 4, 7
7.2.1	Counting zeros & poles	p 271 #
7.2.2	Winding number	p 276 #
7.2.3	Argument principle	p 279 #