

Mathematics SM005 – Fall 2009 – Syllabus

Textbook: Connally, Hughes-Hallett, Gleason, et al, Functions Modeling Change, 3<sup>rd</sup> ed, Wiley

The homework assignments from the textbook are included in the syllabus. Most of the problems are also available for you to do online at Wiley Plus (see handout on Wiley Plus). Your instructor will tell you whether you are expected to do the assignments online. Problems inside parentheses are not available online.

Class	Section	Topic	Homework
1	1.1	Functions and function notation	WileyPlus Introduction – See handout. p. 6 #7, 9, 11, 23, 30, 33
2	1.2	Rate of change	p. 15 #7, 8, 12a, 15, 21a
3	1.3/Tools	Linear Functions	p. 24 #(1), 3, (5), 11, 20, 32 p. 58 #9, 10, 14, 25
4	Tools/1.4	Formulas for linear functions	p. 32 #16, 19, 23, 25, 35 p. 58 #34, 37
5	1.5	Geometric properties	p. 41 #2, 9, 17, 22, 25, 31
6	1.6	Fitting linear functions to data	p. 48 #2
7		Chapter 1 review	p. 50 #5, 9, 13, 21, 23, 40
8	Tools	Quadratic equations	p. 102 #37, 50, 60, 64, 82, 94
9	2.1 2.2	Input and output Domain and range	p. 66 #2, 27a, 28ab, 35a p. 72 #1, 3, 5, 9, 16, 29
10	2.3	Piecewise defined functions	p. 76 #(1, 3), 9, 14bc, 15
11	2.4	Composite and inverse functions	p. 82 #11, 14, 18, 19, 20, 27
12	2.5	Concavity	p. 86 #5, 6, 7, 8, 21
13	2.6	Quadratic functions	p. 92 #1, 4, 8, 13, 16, 28, 30
14		Chapter 2 review	p. 94 #2, 5, 9, 25, 26, 35, 40
15		Review for Test #1	
16		Test #1	
17	Tools	Exponents	p. 148 #(5, 16, 25, 27, 35, 37), 60, 63, 66, 72, 76, 87, 95-104
18	3.1	Introd. to exponential functions	p. 112 #2, 7, 11, 19, 25
19	3.1	Continued	p. 112 #27, 30, 33
20	3.2	Comparing exponential & linear	p. 119 #2, 5, (9), 18, 19, 28
21	3.3	Graphs of exponential functions	p. 127 #(5-8), 15, 17, 33, 35
22	3.4	Continuous growth and no. e	p. 133 #(2, 4), 11, 19, 21
23	3.5	Compound interest	p. 139 #7, 10, 19, 21
24		Chapter 3 review	p. 141 #12, (19), 36, 47, 58
25	4.1/Tools	Logarithms and their properties	p. 157 #2, 11, 18, (19, 20), 24, 25
26	4.1/Tools	Logarithms	p. 157 #26, 34, 36, 38, 44, 49
27	4.2	Logarithms and exponential models	p. 164 #12, 23, 27, 31
28	4.2	Continued	p. 164 #34, 37, 48, 57
29	4.3	The logarithmic function	p. 173 #(1, 3, 7, 9, 23, 25)

30		Chapter 4 review	p. 185 #9, 14, 17, 27, 28, 36, 43, 48b, c
31		Review for Test #2	
32		Test #2	
33	5.1 5.2	Vertical and horizontal shifts Reflections and symmetry	p. 200 #(8, 30), 31, 40 p. 209 #(5, 6), 20, 22, 30
34	5.3 5.4	Vertical stretches/compressions Horizontal stretches/compr.	p. 216 #10, (17), 25, 28 p. 223 #10, 16, 20
35	Tools	Completing the square	p. 241 #(1, 9, 15, 17, 23)
36	5.5	Family of quadratic functions	p. 231 #4, 10, 20, 22, (32), 33
37		Review chapter 5	p. 234 #3, 8, 11, 15, (23, 28, 29), 35
38	6.1	Intro. to periodic functions	p. 247 #7, 9, 23, 29
39	6.2	Sine and Cosine	p. 255 #4, (5, 6, 13), 26, 28, 34
40	6.3	Radians	p. 261 #6, (12), 27, 30, 39
41	Tools	Right Triangles	p. 304 #(3), 6, (11), 18
42	Tools	Continued	p. 304 #21, 23, (27)
43	6.4	Graphs of sine and cosine	p. 267 #3, 8, 18, (21, 22, 23)
44	6.5	Sinusoidal functions	p. 275 #3, 6, 25, 29, 42
45	6.6	Other trigonometric functions	p. 283 #9, 16, 20, 28, 30, 32
46	6.7	Inverse trig functions	p. 292 #(7 – 14), 21, 38
47	6.7	Continued	p. 292 # (40 – 42), 43, 51, 58
48		Review chapter 6	p. 295 #2, 14, 16, 29, 35, 38, 41, 42, 52, 54, 57
49		Review for Test #3	
50		Test #3	
51	7.1	General triangles: Laws of sines and cosines	p. 311 #2, 8, 11, 16
52	7.1	Continued	p. 311 #19, 29, 32
53	7.2	Trigonometric identities	p. 319 #5, 6, 8, 10, 12, 23
54		Trigonometric Equations	p. 319 #(17, 19), 41, 45, 47
55	7.3	Sum and difference formulas	p. 325 #1, 2, (6, 9, 13)
56	7.4	Trigonometric models	p. 334 #(1), 3, (4)
57		Review of chapter 7	p. 348 #(3, 4), 5, 7, 9, 16, 18
58		More review	p. 348 #26, 27, 29, 31, 40, 46
59	8.1 8.2	Composition/inverses of functions (again)	p. 359 #8, 9, 10, 25, 26 p. 371 #8, 16, 18, 20, 31, 37
60	8.3	Combinations of functions	p. 379 #4, 10, 40
61	9.1	Power functions	p. 393 #12, 15, 16, 18, 20, 33, 35, 45
62	9.2	Polynomial functions	p. 400 #2, 8, 17, (22), 27
63			
64	9.3	Short run behavior of polynomials	p. 406 # 9, 15, 17, 23, 35, 39, (40)
65	9.4	Rational functions	p. 413 #2, 3, 7, 11, 12, 20a
66	9.5	Short run behavior	p. 420 #1,3
67	9.6	Comparing power, exponential and log functions	p. 426 #12, 20, (21, 24, 26)

68		Review chapters 8 and 9	p. 382 #4, 6, 15, 25, 28, 40, 51, 64 p. 435 #10, 12, 14, 15, 16, 31, 33, 37, 40, 44, 48, 55
69		Review for test #4	
70		Test #4	
71	12.3	Ellipses	p. 531 #2a, 14, 15, 17a, b
72	12.4	Hyperbolas	p. 536 #1, 4, 11, 15
73		Review for Final	
74		Review for Final	
75		Review for Final	

## Calculator Use

By the end of this course, you must be able to use your calculator to

1. do basic calculations (both exactly and approximately),
2. solve an equation for a variable (both exactly and approximately),
3. simplify algebraic and trigonometric expressions,
4. graph a function, using an appropriate window to see the desired features.

However, you are expected to be able to do **all basic calculations** learned in this course by hand. In particular, you should be able to do the following without your calculator.

1. solve linear and quadratic equations
2. solve equations involving exponentials, logarithmic and trig and inverse trig functions
3. graph linear, quadratic, exponential, logarithmic, trig, inverse trig, polynomial and simple rational functions
4. find values of the trig functions for any integer multiple of  $\pi/2$  and for any angle whose reference angle is one of the common angles.

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