Diff Eqns: Homework Page 1 (7th edition/blue book)

You should always try to do the homework for a topic as soon as possible after the class for that topic. You have been given extra time to get help on difficult problems, but you should be very careful how you use that extra time. Don't wait until the last minute to start your homework.

Remember: Only the Set B problems will be collected and graded.

After Class on:	Section:	Problems	Due Date
1/9/2020	1.1	Set A: #1-13 odd, 17,19,27,31 Set B: #22,25,26,32	Thursday, 1/16/2020

*Hints & Notes:
#22: Don't attempt to solve the DE. And you don't even need to show that the individual functions work: we are told that they do. Simply explain why the piecewise-defined function is not a solution. (Don't bother to plug it in. We know that it will appear to work. Something else is going on.)
#25: Assume $y=e^{mx}$ is a solution. Plug it into the DE, then figure out what that means must be true about m.
#32: What it's asking you to do is write a differential equation that says "the second derivative of a function is equal to the function itself," and then identify any functions you know that actually meet that criteria. Then there is a second one to do as well.

- -

1/14/2020	1.2	Set A: #1,5,7-19 odd Set B: #10,14,20,21-24	Thursday,1/23/2020
	1.3	Set A: #1,7,15,23 Set B: #4,5*,6,8,9,10	Thursday, 1/23/2020

*Hints & Notes:
1.2 #10: We are told what the solution to the DE is. You must find the constants c_1 & c_2 that make that soln fit the initial conditions.
#14 & #20: Your job is to find *some* region R in the x-y plane that meets the conditions of Theorem 1.1.
1.3, #5: Estimating T_m & T_0 are fairly easy. Since k is related to dT/dt, to approx k we must estimate dT/dt somewhere on the graph, then plug into the DE. I used a post-it note along the curve to estimate dT/dt at a particular point.

- -

1/16/2020	2.1	Set A: #1,3,17,19,21,25 Set B: #2*,4*,18,24,26ab	Thursday, 1/23/2020

Hints & Notes: 2.1 #2 & #4: You may either do these two problems by hand or using the direction field website (probably) displayed in class.
By Hand: For your convenience, enlarged copies should have been distributed during class, or they can be found on the class website.
By the website: Some helpful hints are below. You will need some kind of screen grabber or print screen to actually print the picture.

Go to the direction field website: https://homepages.bluffton.edu/~nesterd/java/slopefields.html
(That page is linked on the class website.)
In the box to the upper left, next to dy/dx =, enter the desired DE, then press the enter key.
Below the dy/dx= thing, you can change the range of x & y, if desired.
Farther down you will see a place to "enter (x,y)." Do that, click on submit, and the app will draw a solution curve through that point.

- -

After Class on:	Section:	Problems	Due Date
1/21/2020	Bifurcations	Build a bifurcation diagram for $y' = y^3 - cy$ Clearly identify where you see any bifurcations.	Thursday, 1/30/2020
1/23/2020	2.2	Set A: #1,3,9,13,19,23,25	
	2.3	Set A: #1,5,13,17,21,27	
	2.4	Set A: #1,3,9,11,19,21,23	
	3.1	Set A: #3,5,9,11,13,19,21,29	
		Set B: #1,2,7,14,16,17,18	Thursday, 1/30/2020
1/28/2020	4.1	No homework from this part yet This topic will not be on the first exam.	
Thursday, 1/30/2020	Review for the Exam 1		
Tuesday, 2/4/2020:	Exam 1: Sections 1.1,2,3; 2.1,2,3,4; 3.1		
Thursday, 2/6/2020	**Reading Day: No Classes!!**		

Hints & Notes: 3.1 (all): Your job is to set up and solve the DE, and then answer the particular questions.