

AP CALCULUS AB – HOMEWORK #11

7.1. Exact Differential Equations

Section 7.1 Exercises, pg. 335
12, 13, 78(a,b)

7.1. Slope Fields

Section 7.1 Exercises, pg. 335
35¹, 36¹, 37¹, 38¹, 39¹, 40¹

Supplemental Problems
1

7.1. Separable Differential Equations

Section 7.4 Exercises, pg. 364
1², 2², 6², 9², 43

7.1. The Simple First-Order Linear Differential Equation

Supplemental Problems
2

7.2. Substitution in the Indefinite Integral

Section 7.2 Exercises, pg. 346
17³, 18³, 25, 39, 41, 47

7.2. Substitution in the Definite Integral

Supplemental Problems
3, 4, 5, 6

Notes:

1. Do not bother sketching the solution curves.
2. Do not worry about the domain, just solve for the solution curves $y = y(x)$.
3. You do not have to confirm your results with differentiation.

Supplemental Problems:

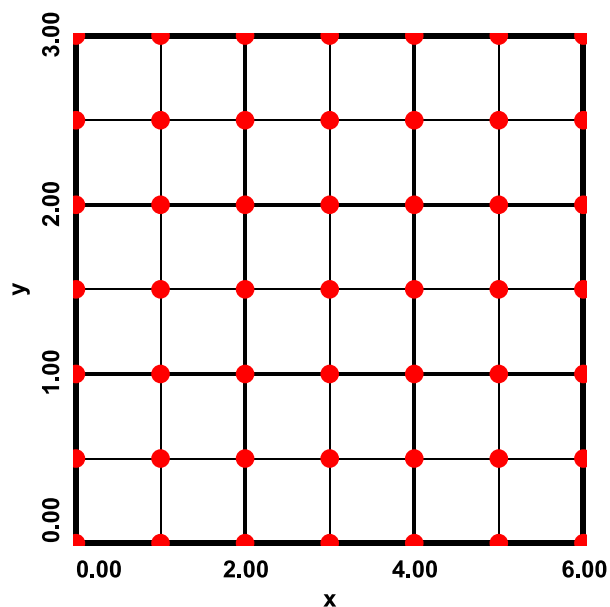
1) For

$$\frac{dy}{dx} + y = 3x^2e^{-x}$$

- a) Calculate the slope field, *i.e.*, fill in the table with the slope values rounded to three digits after the decimal.

	0	1	2	3	4	5	6	x
3.0								
2.5								
2.0								
1.5								
1.0								
0.5								
0.0								
y								

- b) Graph the slope values from the table on the grid below. *Be careful!* The scales of the x – and y – axes are different.



- 2) a) Solve the differential equation from problem 1 for $y = y(x)$ subject to the initial condition $y(0) = 3$.
 b) Graph the solution curve $y = y(x)$ on top of the slope field in problem 1b.

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For problems **3** through **6**, evaluate the definite integrals using substitution. Check your answers with `fnInt`.

3)

$$\int_0^3 x\sqrt{9-x^2} \, dx$$

4)

$$\int_0^1 \frac{x}{\sqrt{4-x^2}} \, dx$$

5)

$$\int_1^5 \frac{\ln x}{x} \, dx$$

6)

$$\int_0^{\sqrt{\pi}/2} x \cos(x^2) \, dx$$