REVIEW 6 – Differential Equations

Summary of Topics for Sections 6.1 to 6.3 and 7.1ab:

Solving a differential equation using a slopefield, ❖Euler's Method, antidifferentiation, or separation of variables
Word problems involving exponential growth and decay, including Newton's Law of Cooling
Stable equilibriums - learning curves, cooling curves, and logistic curves.
Partial Fractions
Area between two curves, vertical and horizontal
TI-CAS:

- solve a differential equation analytically
- generate a slopefield with a particular solution
- perform Euler's method.

Suggested Review Problems from the Textbook

Pg. 443-444 Review Exercises: 3, 5, 7, 9, 11, 13, 16, 19, 21, 23, 19, 20, 21, 25, 29, 34, 35, 43, 45, 47, 49

Pg. AP6-1 AB/BC Test Prep Questions (comes between pages 446 and 447): 3, 7

Pg. 515-516 Review Exercise: 2, 4, 5, 7, 10, 19a

Answers

Suggested Review Problems from the Textbook

Pg. 443-444 Review Exercises

20. $y = -8 + Ce^x$

34a. $y = 51.019(0.98807)^x$.

Pg. 515-516 Review Exercises

2. 16.2
4. $\frac{-16}{3}$
10. 4.511

Pg AP6-1 AB/BC Test Prep Questions

3. a. (Note that this cannot be done by repeated Enters on the calculator because the differential equation involves an x value. You will need to write out each calculation and enter it into you calculator separately. $y_0 = 2$, $y_1 = 2 + \frac{2(1)}{2}(0.2) = 2.2$, $y_2 = 2.2 + \frac{2(1.2)}{2.2}(0.2) = 2.418$, $y_3 = 2.418 + \frac{2(1.4)}{2.418}(0.2) = 2.659$

   b. $y^2 = 2x^2 + C$

   c. $y = \sqrt{2x^2 + 2}$. Note that the TI-CAS answer of $y^2 = 2x^2 + 2$ is NOT an acceptable answer for a particular differential equation because the result is not a function.

7. a. $y = \frac{4000}{1 + 24e^{-0.332965t}}$

   b. 2151 people are infected by day 10.

   c. It will take about 14 days.