

Required reading:

- Larson 9e: pages 425-426
- Dawkins: Differential Equations, section 2-5: Substitutions
<http://tutorial.math.lamar.edu/Classes/DE/Substitutions.aspx>
 - Notes: Read from the beginning through Example 2. (Last modified: 06/03/2018)

Required homework:

- Larson 9e: page 431, problems 45, 46, 47, 48

Additional comments regarding this topic:

AP Calculus BC includes an introduction to differential equations, limiting itself to more basic cases (such as simple separable DEs). Here we expand on this topic, using substitution to take a class of problems called homogeneous DEs and rewrite them so they become separable DEs that we know how to solve.

Additional comments regarding the Larson reading:

We are not too concerned with verifying that functions are homogeneous (Example 4), but it is still good to review this. The idea is this: if we can substitute tx for every x and ty for every y , our function is homogeneous if the end result allows us to cleanly factor out an integer power of t , such that t^n is multiplied by the original function in question.

It is not stated in the instructions, but all four of the homework problems are homogeneous differential equations; it is not necessary to verify this fact.

Additional comments regarding the Dawkins reading:

Dawkins includes separable DEs (and its related topics) with his course notes on Differential Equations, which is a one-semester course (sometimes two semesters) that typically requires two semesters of calculus as a prerequisite. Unlike his Calculus notes, there are no Practice or Assignment Problems posted online.

Do not be too concerned with the portions of the examples that concern the interval of validity.