

Rules for the take-home exam

- 1 I will turn in this sheet, along with a **printout of your Maple worksheet**, before my class on Tuesday, 04/23/2019.
- 2 I know there is ABSOLUTELY NO EXTENSIONS and late submission will be severely penalized.
- 3 I solved all solutions completely by myself and did not show it or discuss it with anybody.
- 4 I will show much more work in my Maple worksheet than the attached examples do. (The attached examples are simple, brief and are for illustration only. **Be creative and thorough**)
- 5 I may have used my class notes, textbook, and publicly available materials, including books, online resources, etc.

By signing my name below, I certify that I have read, understood and complied with the above rules.

Name : _____

ID : 850 _____

Show all work and follow the examples attached in the email. Be creative!

1. (10 pts) Let a be your last digit in your ID. (For instance, if your id is 850444888, then $a = 8$.)

(a) Find a sequence u_1, u_2, \dots, u_9 which approaches a solution of the equation

$$x^{2a+4} - ax^2 - 10 = 0$$

by using Newton's method with two different initial values, $x_1 = 1.2$ and $y_1 = 2.1$. Explain it if Newton's method does not work in your case.

(b) Verify it by using the solving-equation method and plotting-graph method.

(c) Write down your own conclusions.

2. (10 pts) Let a is your last digit in your ID, and $y = \sin x$ and $y = x^{2a+4}$ two curves.

(a) Find intersection points of these two curves. (Prove it if there is no intersection points.)

(b) Graph the region bounded by these two curves. (Prove it if there is no region bounded by these two curves.)

(c) Color the region.