

Preparing for Your First Gateway Exam

You will have your first gateway exam of the year in lab on Tuesday, February 27th. The gateway exam will focus on two main areas:

- (1) Differentiation of functions - including appropriate use of the Product Rule, the Chain Rule, and Implicit Differentiation.
- (2) Solving equations, using techniques for solving linear and quadratic functions and using logarithms appropriately to solve for variables in exponents.

Gateways are meant to test technical skills that we expect you to have proficiency with. The skills tested in this particular gateway are skills that you should have with you from Math Xa.

It is advisable to use the problems provided below to prepare yourself for the upcoming gateway. If you know that you are rusty on any of the topics listed above, first study a bit, and then try the problems provided. Gateways must be taken until they are passed. (Try to pass the very first time - but if you do not do so, you can take alternate versions of the gateways. There is no penalty in terms of your grade if you need to take the gateway more than once.)

Problems to Help You Review for the First Gateway

Find $\frac{dy}{dx}$: As always, try to choose from among the tools you have in order to do the problem in the simplest way possible.

1. $y = \frac{\ln(1/x^2)}{e^{2x}}$

2. $y = \frac{\pi^2}{\sqrt{e^{7x}+2}}$

3. $x^2y = \frac{3e^{xy}}{\sqrt{3}}$

4. $y = \frac{x}{\ln(x+y)}$

5. $y = \frac{\pi}{\ln \sqrt{x^2+4}}$

6. $y = \sqrt{11}(1 + \frac{0.1}{12})^{12x}$

7. $y = 6xe^{\sqrt{x^2+3x}}$

8. $y = \frac{\ln \sqrt{x}}{\sqrt{x}}$

Solve each of the following equations for the variable indicated.

9. $W = W_0[1 + \frac{r}{n}]^{15}$ (r)

10. $W = W_0[1 + \frac{r}{n}]^{nt}$ (t)

11. $e^t(\frac{dy}{dt} + 1) + 2e^t = \frac{dy}{dt} - 2$ ($\frac{dy}{dt}$)

12. $3AB^{2x+1} = 5B$ (x)

13. $\frac{B^2+BC^t}{D} = 7B$ (t)

Answers to these problems will be posted on the course Website.