

Assignments for Math 125 for Fall 2016

(assignments are due on the date listed)

for Wednesday, August 31

1. Read the syllabus (available online) very carefully.
2. Go to <http://people.whitman.edu/~gordon/> and read the material at the link Advice for Students.
3. Read the preface of the textbook (titled *Calculus Concentrate* and available online).
4. Skim the first few sections of the textbook to get a sense for its writing style.

for Friday, September 2

1. Reread the syllabus if necessary, paying particular attention to the expectations for writing solutions to problems that are to be collected for grading.
2. Read Section 1.1.
3. Do exercises 1–8 in Section 1.1. Note that a few of these problems fit into the category ‘nonroutine’ as discussed in the syllabus.
4. Quiz 1 is due at the beginning of class.
5. Spend a few minutes looking over Section 1.2.

for Monday, September 5

1. Read Section 1.2.
2. Do exercises 1–15 in Section 1.2. If time becomes a factor, you may skip exercises 1, 2, 3, 10, and 13.
3. Spend a few minutes looking over Section 1.3.

for Wednesday, September 7

1. Read Section 1.3.
2. Do exercises 1–7 in Section 1.3.
3. Quiz 2 is due at the beginning of class.
4. Spend a few minutes looking over Section 1.4.

for Friday, September 9

1. Read Section 1.4.
2. Do exercises 1–9 in Section 1.4.
3. Quiz 3 is due at the beginning of class.
4. Spend a few minutes looking over Section 1.5.

for Monday, September 12

1. Read Section 1.5.
2. Do exercises 1–4 in Section 1.5.
3. Spend a few minutes looking over Section 1.6.

for Wednesday, September 14

1. Read Section 1.6.
2. Do exercises 1–8 in Section 1.6. Note that the derivatives needed for exercises 6–8 are determined in Exercise 5 so there is no need to compute (using limits, etc.) them again.
3. Spend a few minutes looking over Section 1.7.

for Friday, September 16

1. Read Section 1.7.
2. Do exercises 1–10 in Section 1.7. Think rather than freak as you read and ponder exercises 5–10.
3. We will have our first in-class quiz today. It will cover anything from Sections 1.1 to 1.6 but the focus will be on the more basic ideas and computations. The quiz will be roughly 15 minutes long.
4. Spend a few minutes looking over Section 1.8.

for Monday, September 19

1. Read Section 1.8.
2. Do exercises 1–9 in Section 1.8. Remember to use simple formulas rather than limits to find derivatives.
3. Quiz 5 is due at the beginning of class.
4. Spend a few minutes looking over Section 1.9.

for Wednesday, September 21

1. Read Section 1.9.
2. Do exercises 1–6 in Section 1.9. For Exercise 3, do not let the generic constants k and c throw you off; they behave just like numbers. You might find it helpful to sketch a graph for this problem. For Exercise 4, note that we have done several problems of this type; the ideas are the same for all of these problems. The purpose of Exercise 5 is for you to remember the definition of the derivative. Give Exercise 6 a fair shot; it is not as intimidating as it may first appear.
3. Quiz 6 is due at the beginning of class.
4. Spend a few minutes looking over Section 1.10.

for Friday, September 23

1. Read Section 1.10.
2. Do exercises 1–7 in Section 1.10. Exercise 4 is yet again a problem that asks for points on the graph where a tangent line goes through a given point off the graph. Exercises 5 and 6 are checking to be sure you can work with symbols and that you understand the chain rule.
3. Spend a few minutes looking over Section 1.11.

for Monday, September 26

1. Read Section 1.11.
2. Do exercises 1–8 in Section 1.11. The biggest challenge for some of these problems is doing the algebra required to simplify the derivative. Try not to spend too much time on algebra and thus lose sight of the derivative formulas you are learning.
3. Quiz 7 is due at the beginning of class. This will be the first of our no help take-home quizzes. To be specific (perhaps overly so given some past difficulties that have arisen) concerning what it means to work alone, you may not seek help from classmates, you may not seek help from other professors or students, you may not seek help from me (except for questions of clarification), you may not seek help from any books other than the textbook (and your notes), you may not seek help from the Internet, and you may not seek help from Maple, Wolfram Alpha, or any electronic devices. Following these guidelines falls under the category of the academic dishonesty form that you signed when you first arrived at Whitman. Even talking briefly to someone about the problems or sharing notes is a violation of the policy. I want to see what you can do on your own with these problems and I want you to learn to rely on your own mental resources to solve a problem.
4. We will review in class for the exam on Wednesday.

for Wednesday, September 28

1. We have an exam on Sections 1.1 through 1.11. Any problem assigned thus far, any problem similar to a problem assigned thus far, and any problem that uses ideas considered thus far is fair game for the exam. However, most of the exam questions will be similar to the more basic homework problems. Here are a few specifics.
 - a. No calculators or electronic devices will be allowed during the exam. This means that you need to be able to do simple arithmetic and basic algebra without assistance.
 - b. Use of correct notation is expected; points are deducted when incorrect notation is used. Also, a complete sentence to finish the problem is expected with the understanding that a clear equation constitutes a complete sentence.
 - c. Hopefully, you now understand the writing expectations for in-class work. If not, check with me. I do not want you to write too much and run the risk of not having time to complete the exam or write too little and lose points for not being clear with your answers.
 - d. One problem that is certain to be on the exam will be to fully state the definition of the derivative. This means that you are expected to write Definition 1.7 (page 16) in its entirety, that is, including all of the words. However, it is fine to use only one version of the limit.
 - e. On a cautionary note, if you know or suspect that you are having problems in this class, deal with them now rather than waiting until you fail the first exam and dig yourself a big hole.

for Friday, September 30

1. You can review derivative formulas and the meaning of the derivative if you feel you are still working to master these concepts.
2. Spend a few minutes looking over Section 1.12.

for Monday, October 3

1. Read Section 1.12.
2. Do exercises 1–4 in Section 1.12. You should be able to do the problems in Exercise 1 without a calculator. However, you might find it helpful to look at the graphs of the functions to verify that your answers are correct. Do give exercises 3 and 4 careful thought.
3. Spend a few minutes looking over Section 1.13.

for Wednesday, October 5

1. Read Section 1.13.
2. Do exercises 1–5 in Section 1.13. Once again, you should be able to do the problems in Exercise 2 without a calculator but looking at a graph may help you confirm your answers. The last three problems in Exercise 2 involve a parameter; just treat a like a number. Do not ignore the last three exercises; see if you can understand and prove what they are asking.
3. Quiz 8 is due at the beginning of class.
4. Spend a few minutes looking over Section 1.14.

for Friday, October 7

1. There is no class today due to the October break.

for Monday, October 10

1. Read Section 1.14.
2. Do exercises 1–5 in Section 1.14. Think carefully about exercises 4 and 5 as they ask you to think about the ideas in this section in a different way.
3. Quiz 10 is due at the beginning of class.

for Wednesday, October 12

1. Read Section 1.15.
2. Do exercises 1, 2, 4, 6, and 11 in Section 1.15. Be patient as you work on and think about these word problems.

for Friday, October 14

1. Reread portions of Section 1.15 if necessary.
2. Do exercises 3, 5, 7, 12, and 14 in Section 1.15.
3. Quiz 11 is due at the beginning of class.

for Monday, October 17

1. Read Section 1.16.
2. Do all of the exercises in Section 1.16. If necessary, you can find some online resources to help you review trigonometry. You should do exercises 1, 2, 3, 5, 8, 9, 14, 17, and 18 without an electronic device. For the other computational exercises, you will need a calculator to find the requested values.

for Wednesday, October 19

1. Read Section 1.17.
2. Do all of the exercises in Section 1.17. These exercises give you good practice with all of the derivative rules. If time becomes a factor, you can omit exercises 1i, 3c, 4, and 8.
3. Quiz 12 is due at the beginning of class.

for Friday, October 21

1. Read Section 1.18.
2. Do exercises 1–7 in Section 1.18.
3. Quiz 13 is due at the beginning of class.

for Monday, October 24

1. Read Section 1.19.
2. Do exercises 1–7 and 11 in Section 1.19. If necessary, you can find some online resources to help you review exponential and logarithmic functions.
3. There will be an in-class quiz (Quiz 14). If you have been keeping up with the homework, then you should not need to do additional studying. The new derivative formulas that you need to know for this quiz are those for $\sin x$, $\cos x$, $\tan x$, $\arcsin x$, and $\arctan x$.

for Wednesday, October 26

1. Read Section 1.20.
2. Do exercises 1–7 in Section 1.20. The derivatives in Exercise 1 should go quickly. Exercises 2–6 involve the standard applications of the derivative that we have been discussing the past few weeks. Exercise 7 is another variation of a problem that we have considered multiple times in previous sections. Some of you may find Exercise 9 intriguing so you might give it a try if you have time.

for Friday, October 28

1. Read Section 1.21.
2. Do exercises 1–3 in Section 1.21.
3. Quiz 15 is due at the beginning of class.

for Monday, October 31

1. Read Section 1.22.
2. Do exercises 1, 4, 5, and 8 in Section 1.22.
3. Quiz 16 is due at the beginning of class.
4. During class, we will review for the exam on Wednesday.

for Wednesday, November 2

1. We have an exam on Sections 1.12 through 1.22, but keep in mind that we have been using many ideas (like the product rule, the quotient rule, and the chain rule) from previous sections as well. Any problem assigned thus far, any problem similar to a problem assigned thus far, and any problem that uses ideas considered thus far is fair game for the exam. However, almost all of the exam questions will be similar to the more basic homework problems. You can go back over the exercises in each section as well as doing exercises 28, 31a, 32, and 38 in Section 1.35. Here are a few specifics.
 - a. No calculators or electronic devices will be allowed during the exam. This means that you need to be able to do simple arithmetic and basic algebra without assistance.
 - b. Use of correct notation is expected; points are deducted when incorrect notation is used. Also, a complete sentence to finish the problem is expected with the understanding that a clear equation constitutes a complete sentence.
 - c. Hopefully, you now understand the writing expectations for in-class work. If not, check with me. I do not want you to write too much and run the risk of not having time to complete the exam or write too little and lose points for not being clear with your answers.
 - d. One problem that is certain to be on the exam will be to fully state the definition of the derivative. This means that you are expected to write Definition 1.7 (page 16) in its entirety, that is, including all of the words. However, it is fine to use only one version of the limit. In addition, you should be familiar with both the Intermediate Value Theorem and the Extreme Value Theorem.
 - e. You need to know a number of derivative formulas (there are 20 of them) for this exam so make sure you have them at ready recall. You should also be aware of standard problem types and what to do for them. For example, if a problem starts with “Find the maximum and minimum outputs”, you know you need to make a chart (table of values).
 - f. On a cautionary note, if you have been working with a tutor and/or other students, it is imperative that you make certain that you can do the work on your own. Getting help to learn the material is fine, but then you need to take ownership of the knowledge and be able to apply it yourself.

for Friday, November 4

1. Over the next few class periods, we will once again consider limits; you might want to glance at Sections 1.23–1.25 for a quick preview.

for Monday, November 7

1. Read Section 1.23.
2. Do exercises 1a, 1b, 1c, 1d, 3b, 4, 5, and 6a in Section 1.23. Except for the last one, all of these exercises require a calculator.

for Wednesday, November 9

1. Read Section 1.24.
2. Do exercises 1–7 in Section 1.24. There are quite a few problems here but most of them should go quickly. You can start by doing a few problems under each exercise heading. Think carefully about the notion of limits that involve the concept of infinity.

for Friday, November 11

1. Read Section 1.25.
2. Do exercises 1–4 in Section 1.25. There are quite a few problems so you can start by doing a few problems under each exercise heading.
3. Quiz 17 is due at the beginning of class.

for Monday, November 14

1. Skim Sections 1.26 and 1.27, focusing on the key ideas.
2. Do exercises 1, 2, 3, 4, 6, and 7 in Section 1.26, and exercises 1, 2, and 8 in Section 1.27.
3. Quiz 18 is due at the beginning of class.

for Wednesday, November 16

1. Read Section 1.28.
2. Do exercises 1, 2, 3, 4, 5, and 7 in Section 1.28. Note that the product rule enters the picture when finding the second derivatives in Exercise 1. The patterns in Exercise 2 are not difficult so do not give up too quickly. Exercise 7 requires some thought but it is not as scary as it looks; there is more than one correct answer.
3. We will have an in-class quiz (Quiz 19) on this day. If you have been doing the basic problems assigned over the past few sections (1.24–1.28), you will be well-prepared for the quiz.

for Friday, November 18

1. Read Section 1.29.
2. Do exercises 1, 2, 3, 4, 6, and 8 in Section 1.29. You do not need to know much physics in order to solve these problems, but you will need a calculator for some of the computations.
3. Quiz 20 is due at the beginning of class.

for Monday, November 28

1. Read Section 1.30.
2. Do exercises 1, 2, 3, and 4 in Section 1.30.

for Wednesday, November 30

1. Read Section 1.31.
2. Do exercises 1a–1d, 2, 3, and 4 in Section 1.31.
3. Quiz 21 is due at the beginning of class.

for Friday, December 2

1. Read Section 1.32.
2. Do exercises 1–9 in Section 1.32. Once you feel confident with implicit differentiation, you may not need to do all of the parts of Exercise 2. In addition to providing practice with implicit differentiation, exercises 3 and 5 are good review for the final exam. Exercises 7–9 are more challenging so be prepared for them to take a little longer but do spend some time thinking about them.
3. Quiz 22 is due at the beginning of class.

for Monday, December 5

1. Read Section 1.33.
2. Do exercises 1, 3, 5, 6, and 9 in Section 1.33. As with all word problems, you must be patient as you turn the words into mathematics. Recall that some formulas from geometry can be found in the appendix.
3. Quiz 23 is due at the beginning of class.

for Wednesday, December 7

1. We have an exam on Sections 1.23–1.33. You must be able to state the definition of the derivative, the definition of the limit, and the Mean Value Theorem. You also need to know the formulas for polynomial approximations for functions and for Newton’s method. In addition to reviewing the sections and looking over quizzes 17–23, you can focus on the following problems.

1.23: 1a, 1d, 3b

1.24: 1b, 1d, 1i, 2d, 2f, 4c, 5b

1.25: 1b, 1e, 1f, 2c, 2d, 3d

1.26: 1c, 1d, 7

1.27: 1c, 2a

1.28: 1b, 1c, 4a, 4b, 4e, 5

1.29: 3b, 4, 12, 15

1.30: 1b, 1c, 1e

1.31: 1a, 2, 3

1.32: 2a, 2c, 3, 5, 7

1.33: 1, 3, 5, 6, 9

1.35: 41, 42, 44, 45