

# Classical Algebra (Math 326)

## Assignments

Fall Semester, 2006

Assignments are listed by the **date due**.

PDF and DVI (requires  $\text{TeX}^1$  software) versions of this page are available for printing.

Most of these assignments are simply exercises designed to prepare you for the quizzes and the written assignments. Those which are to be submitted as written assignments are so labeled. While you may find it helpful to discuss the exercises with others, no collaboration is permitted on the written assignments.

**Mon., Dec. 18:**

**Final Examination:** 3:30 – 5:30

**Exam Period Office Hours**

Thurs., Dec. 14 2:30 – 3:30  
Fri., Dec. 15 3:00 – 4:00  
Mon., Dec. 18 12:00 – 1:00

**Tue., Dec. 12:**

Last regular class meeting.

Expect a **quiz**.

Written Assignment No. 5 (also available as PDF) is due.

Bring questions for review.

**Thu., Dec. 7:**

**Read:** §§ 28B, 28C

**Exercises:**

**351:** 13, 15  
**356:** 6, 7, 10  
**418:** 8, 11, 12  
**421:** 1, 2, 5 – 7  
**425:** 4 – 6, 9 – 12

**Tue., Dec. 5:**

**Read:** §§ 24A, 28A

**Exercises:**

**252:** 14, 15  
**263:** 11  
**307:** 8 – 10, 12, 14  
**350:** 9, 10, 12  
**356:** 2 – 5  
**416:** 2, 3, 5, 6

**Thu., Nov. 30:**

Expect a **quiz**.

**Read:** §§ 20A, 20B, 23A

**Exercises:**

1. **251:** 10 – 13
2. **257:** 3, 5, 6

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<sup>1</sup>URI: <http://www.tug.org/>

3. **262:** 7, 9, 10
4. **303:** 1 – 5
5. **309:** 1 – 3
6. **350:** 2 – 4, 11
7. Find primitive elements for  $\mathbf{Z}/17\mathbf{Z}$  and  $\mathbf{Z}/34\mathbf{Z}$ .
8. Show that there is no primitive element in  $\mathbf{Z}/32\mathbf{Z}$ .

**Tue., Nov. 28:**

**Read:** §§ 15D, 16A, 16B, 16C, 16D

**Exercises:**

- **205:** 7, 8
- **243:** 5, 7, 8
- **246:** 1 – 4, 6
- **248:** 6 – 10
- **251:** 7 – 9
- **257:** 1, 2
- **262:** 1 – 3, 6

**Thu., Nov. 23:**

**Thanksgiving Recess:** no class

**Tue., Nov. 21:**

Written Assignment No. 4 (also available as PDF) is due

**Thu., Nov. 16:**

**Read:** §§ 15A, 15B

**Exercises:**

- 163:** 18, 21, 22
- 200:** 13, 15
- 205:** 5, 6
- 236:** 4, 5
- 238:** 7 – 9
- 241:** 1
- 243:** 4, 6
- 245:** 1

**Tue., Nov. 14:**

Expect a **quiz**.

**Read:** §§ 12B, 14

**Exercises:**

- 141:** 18
- 163:** 15 – 17
- 200:** 5 – 7, 11, 12
- 202:** 1, 3
- 233:** 1 – 3

**Thu., Nov. 9:**

Written Assignment No. 3 (also available as PDF) is due.

**Tue., Nov. 7:**

**Read:** §§ 10B, 12A

**Exercises:**

- 141:** 16, 17, 19

**145:** 16, 17  
**153:** 3, 8  
**163:** 10, 11, 13, 14  
**166:** 1, 2  
**169:** 3, 4  
**196:** 1 – 3

**Thu., Nov. 2:**

**Read:** §§ 9E, 9F, 10A

**Exercises:**

**141:** 9 – 11, 13 – 15  
**144:** 7, 11(i–iii), 12, 13, 15  
**147:** 3, 5, 6(ii)  
**153:** 1, 2  
**158:** 1 – 4, 7

**Tue., Oct. 31:**

**Read:** §§ 9B, 9C, 9D

**Exercises:**

**123:** 14, 15  
**126:** 7 – 9  
**133:** 7, 8, 10  
**137:** 3, 5, 7 – 9  
**141:** 3 – 5, 7  
**142:** 1, 4  
**144:** 8  
**147:** 2, 4, 6(i)

**Thu., Oct. 26:**

**Expect** a quiz.

**Read:** §§ 8B, 8C, 9A

**Exercises:**

**90:** 12, 13  
**110:** 4(e, f), 5(a) with  $x_0 = 15$ , 5(b) with  $x_0 = 36$   
**122:** 8, 9, 12, 13  
**125:** 2 – 6  
**133:** 5, 6, 9  
**136:** 1, 2, 4

**Tue., Oct. 24:**

**University classes suspended, no assignment.**

**Thu., Oct. 19:**

**Midterm Test, in class**

**Tue., Oct. 17:**

**Read:** § 8A

**Exercises:**

**89:** 6, 7, 9 – 11  
**102:** 3  
**105:** 2  
**110:** 4(c, d)  
**121:** 1 – 5

**Review the course, and bring your questions.**

**Thu., Oct. 12:**

Written Assignment No. 2 (also available as PDF) is due

**Tue., Oct. 10:**

**Read:** §§ 6E, 7C, 7D, 7E

**Exercises:**

**74:** 9

**86:** 5, 7 – 9

**89:** 1 – 5

**100:** 1 (i – iv), 2

**105:** 1, 3

**110:** 4(a, b)

**Thu., Oct. 5:**

**Read:** §§ 6A, 6B, 6C, 6D

**Exercises:**

**54:** 32 – 34

**67:** 9

**70:** 6

**72:** 4, 5

**73:** 2 – 8

**80:** 3

**84:** 1 – 5

**86:** 1 – 4

**Tue., Oct. 3:**

**Read:** §§ 5C, 5D, 5E

**Exercises:**

**52:** 10, 11, 13, 15

**54:** 28, 30, 31

**65:** 6 – 8

**67:** 2, 3, 5 – 8

**70:** 1 – 5

**72:** 1 – 3

**73:** 1

**Thu., Sep. 28:**

**Read:** §§ 4C, 5A, 5B

**Exercises:**

**35:** 18

**50:** 3, 4

**51:** 3 – 5, 7 – 9

**53:** 19 – 21, 25

**55:** 1

**64:** 1, 3, 4, 5

**Tue., Sep. 26:**

Written Assignment No. 1 (also available as PDF) is due

**Thu., Sep. 21:**

**Read:** §§ 3E, 4A, 4B

**Exercises:**

1. **35:** 8, 9, 13, 20

2. **45:** 1, 3

3. **49:** 1, 2

4. **51:** 1, 2

5. Find the continued fraction expansion of:

- (a)  $40487/257$ .
- (b)  $\frac{1+\sqrt{5}}{2}$ .
- (c)  $\sqrt{17}$ .

**Tue., Sep. 19:**

**Read:** Read the notes on *Continued Fractions*<sup>2</sup>

**Exercises:**

1. **29:** 4, 6(ii, v)
2. **33:** 2, 3, 4(iii, iv, v)
3. **35:** 5, 6, 7(i, ii)
4. **And these:**
  - (a) Find the continued fraction expansions of the rational numbers
    - i.  $\frac{61}{67}$ .
    - ii.  $\frac{44}{37}$ .
  - (b) Find the continued fraction expansion of  $\sqrt{2}$ .
  - (c) Find the first three integers in the continued fraction expansion of  $\sqrt[3]{5}$ . (Feel free to use a calculator for this one.)
  - (d) Evaluate the finite continued fraction represented by the sequence  $[3, 2, 7, 2]$ .

**Thu., Sep. 14:**

**Read:** §§ 3B, 3C

**Exercises:**

- 23:** 5
- 24:** 5
- 27:** 6, 9, 10, 11
- 29:** 2, 5, 6(iii, iv)
- 33:** 4(i)

**And this:** Recall that  $20314_5$  was found to be  $1334_{10}$ . Cipher in base 5 to convert this number from base 5 to base 7, and then check that result by converting it from base 7 to base 10.

**Tue., Sep. 12:**

**Read:** §§ 2D – 2F, 3A, 3B

**Exercises:**

- 6:** 4
- 11:** 6, 8
- 18:** 2
- 19:** 1
- 23:** 1 – 4
- 24:** 1 – 3
- 27:** 5

**Thu., Sep. 7:**

**Read:** §§ 1, 2A – 2C

**Exercises:**

- 6:** 2
- 11:** 2, 4, 5, 10, 14
- 15:** 2, 4

If you wish to enter the writing intensive division of the course (Math 326Z), please be sure to submit the required essay<sup>3</sup> (also available as PDF<sup>4</sup>) at this class (or earlier).

<sup>2</sup>URI: <http://math.albany.edu/math/pers/hammond/course/cfrac/>

<sup>3</sup>URI: <http://math.albany.edu/math/pers/hammond/course/mat326f2006/ab326wi.xhtml>

<sup>4</sup>URI: <http://math.albany.edu/math/pers/hammond/course/mat326f2006/ab326wi.pdf>

**Tue., Sep. 5:**

**First meeting:** no assignment.

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