

## WELCOME TO MATH 106

Refer to this page for daily announcements, assignments, and other resources and materials (including videos, pdfs, and even links for emergency remote meetings).

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### Syllabus

Revised schedule will be posted here soon.

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NOTE: Each assignment is written on the day you are to do it, not the day it is due. So an assignment on Tuesday is to be done by Thursday. Tues assignments are usually a bit longer than other days.

I do not collect assignments unless I announce ahead of time that I will do so. It is up to you to work them through and to have questions for me when the class next meets.

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### WEEK 1 AUG 23-26

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 ALL CLASSES NOW MEET ALL DAYS IN SCIENCE II ROOM 255

- Read Section 1.1 Real numbers in textbook *Intermediate Algebra for College Students*

Note, you can access a free e-book for about 12 more days at BVT press. Enter A2826662 in the Instant Access Code field and click on the "Go" button. Follow instructions to create an account.

- Do Sec 1.1 exercises (pp 7-8), #1-40
  - For Thursday: Read Sec 1.2 Fraction operations, order of operations
  -  For Friday: Do Sec 1.2 exercises (pp 19-20) #1-32 even, #34-60 even & #73-76
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### WEEKEND AUG 26-28

- Lecture notes Week 1
- Complete the 'For Friday' exercises (above)
- Read Secs. 1.3 & 1.4 Signed numbers and Basic exponents

Do this quiz as practice, using your notes. Hand it in with your actual quiz tomorrow.

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### WEEK 2 AUG 29-SEPT 2

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### Monday

\* Mini-videos to watch tonight: Rules of negative numbers

Fun number line with a bird

Evaluating algebraic expressions

- Do Sec 1.3 exercises (pp 23-24) # 1-28 even and 40
- Do Sec 1.4 exercises (pp 28-29) # 1-54 even and 57, 62, 64, 68

## Tuesday

- Catch up on Monday's posted items
- Read Sec 1.5. Properties of reals
- Do Sec 1.5 exercises (p 34) # 19 & 26-50 even

**Thursday** I was out this day, but you should have read this anyway.

- Read Sec 1.6 Basic absolute value and absolute value inequality
- View Basic absolute value equations and Basic absolute value inequalities
- Do Sec 1.6 exercises (p 43) # 1-22 even & 31-68 even

**Friday through Labor Day** Though we will not have covered much into rational ("fractional") exponents by the end of Friday's lecture, please read those sections and view the essential videos on them at the bottom of this homework section.

- Read Secs 8.1 & 8.2 Integer exponents
- View Exponents explained
- Do Sec 8.1 (p 279) #16-68 every other even; Sec 8.2 (p 284) #1-71 every other odd
- View:

1. Fractional exponents
2. Simplifying exponents with fractions

Here are Lecture Notes Week 2

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WEEK 3 SEPT 6-9

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**Tuesday** *Repeating the exercises from the weekend:* do these, and be ready with questions for me!

Do Sec 8.1 (p 279) #15-67 every other odd Do Sec 8.2 (p 284) #1-71 every other odd

 At the top of this page, under the syllabus, is the Schedule and Readings and Exercise List for the semester

## Thursday

- Read (if you have not yet done so) Sec 8.3
- Do Sec 8.3 p 291 #1-63 odd - here are the videos again:

1. Fractional exponents

## 2. Simplifying exponents with fractions

Lecture notes Week 3

### **Friday-Sunday**

- View simplifying a radical with variables; these are similar but each has helpful examples:

1. Video 1
2. Video 2
3. Video 3

- Do Sec 8.4 p 197 #1-67 odd

🤖 Start preparing for Exam 1, Monday Sept 19!

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WEEK 4 SEPT 12-16

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**Mon and Tues** Finish the Sec 8.4 homework – here's another video on Simplifying radicals

View Combining radicals with addition and subtraction and Rationalizing the denominator

Read Sec 8.5 and do the assigned p 301 #1-43 odd (as many as you can with the reading and the videos as a guide)

IMPORTANT: You will not need to rationalize a two term denominator on this exam!

Watch the Office hour Thursday video!

Watch for the review sheet soon! Work on it and bring your work to class to ask questions tomorrow ~

**Friday** Exam 1 has been moved to Monday, Sept 19.

There's an excellent set of review exercises in your book!! See pp 45-49 for Ch 1 and pp 312-316 for Ch 8. Exclude imaginary numbers (anything with  $i$ ) and rationalizing denominators if they entail sums or differences of radicals, which requires radicals.

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WEEK 5 Sept 19-23

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### **Monday**

- Read Sec 2.1 Linear equations
- View these mini-videos on Solving Linear Equations:

1. Example 1
2. Example 2

### 3. Example 3

- Do Sec 2.1 (p 59) #11-45 odd, 53,57
- Read 2.2 Word problems

### Wednesday

- Do Sec 2.2 (p 66) #1,3,5,15,17,23,25,41,43,45
- Read Sec 2.3 Formulas
- Do Sec 2.3 (p 71) #1-27 odd

### **FRIDAY WE WILL MEET REMOTELY AT THE ZOOM LINK**

### Friday 9/23 through Wednesday 9/28

- Read Secs 2.4, 2.5 Linear inequalities, abs value equations
- View these mini-videos on Solving Linear Inequalities :

1. Example 1
2. Example 2

- Do Sec 2.4 (p 76) # 1-47 odd
- Read 2.5 Abs value equations, inequalities
- Do Sec 2.5 (p 81) # 1-47 even

### **Sunday posting** Here's the weekend homework!

- We are back to doing the quiz for homework! Watch the these mini-videos (repeating from above):

1. Example 1
2. Example 2

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WEEK 6 Sept 28-30

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### Wednesday

- Catch up on homework listed for over the weekend
- If you hope to correct any errors of content from you first exam, I recommend you work through Exam 1 Sec 01 and Exam 1 Sec 02. I appreciate that some of you asked to see these in clean form again.

### Thursday

I accidentally posted a shorter version of the quiz than what I handed out in class on Friday. As long as you handed in one of these papers, you will have your homework credit. Obviously, I prefer you be in class and get the handout in order to avoid this kind of situation.

For tonight, go back and read sections 2.4 and 2.5. No written homework tonight, as I worked on something different with you today. However, please watch these videos on absolute value equations and inequalities:

2024/08/05 18:155/12

Solving absolute value equations

Solving absolute value inequalities example 1

Solving absolute value inequalities example 2

Solving absolute value inequalities example 3

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**WEEKEND HW** A familiar topic that you'll enjoy!

Read Sec 7.1 and 7.2 Slope of line, equations of lines

View:

Graphing lines from a point and slope

Find equation of line using point-slope form

Do exercises in Sec 7.1 (p 242) #2-20 *even* & Sec 7.2 (p 251) #2-30 *even*. (The videos will be very helpful.)

I'll desk check these on Monday; show your work and be sure you show all your work!

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WEEK 7 OCT 3-7

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**Monday** There's a mini-quiz on absolute value equation and inequalities tomorrow (Tuesday)–no make-ups, don't miss it!

Practice question  $|5 - x| = 9$   $|5 - x| < 9$   $|5 - x| \geq 9$

Solve each, expressing the answer algebraically, graphically, in interval notation.

**Tuesday-Thursday** By now you should be able to finish Sec 7.2 (p 251) #2-58 even

- Read Sec 7.3 and view Graphing vertical and horizontal lines
- Graphing parallel and perpendicular lines
- Do Sec 7.3 (p 259) #1-16 *all*
- In Sec 7.2, add word problems #69-72

 I will update the schedule to reflect our pace and topics in class. No quiz tomorrow.

We will finish Ch 7 tomorrow and Monday, so please bring your Ch 7 pp (all of them) to class Friday.

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WEEKEND OCT 7-9

Look over Lecture notes from the last 2 weeks. The first page of Friday's outlines the topics for Exam 2, which is Thursday. I'm adding percent word problems. See practice problems under Monday homework.

### **Friday-Sunday**

- Read Sec 7.4 Linear inequalities of two variables
  - View Graphing linear inequalities in one or two variables
  - Do Sec 7.4, p 266, #1-35 odd
  - Read Sec 12.1 Distance & midpoint
  - Exam 2 topics
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### WEEK 8

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- View Distance and midpoint formula
- Do Sec 12.1, p 448, #1-25 odd
- Practice exercises for Exam 2 will appear here

IMPORTANT: The first part of Exam 2 will be on Thursday and the second part on Monday. We will go over word problems Friday and they start the new material Tuesday.

Thanks to Amanda for asking for better detail on the percent problems!

- Solving percent, base, rate problems
- Practicing them

**Wednesday** Since Exam 2 is moved to Friday/Monday, I will have extra office hours tomorrow (Thursday) from 2 to 4.

You can also, at any time on the following fliers, see an EOP tutor:

1. "First Year math tutoring hours"
  2. Dan McKinney "Math Master tutoring and review sessions"
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### FALL BREAK WEEKEND HOMEWORK OCT 21-23

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### **Friday-Sunday** *REQUIRED VIEWING ON POLYNOMIALS*

The next section is a topic that you have done recently, either during summer workshop or in several high school mathematics classes.

We are several sections behind! You are responsible for watching these videos and doing the worksheets that form the basis of Unit 4.

The terrific internet teacher Professor Dave gives lectures that are very clear and enjoyable. Most of these videos have a 'Checking comprehension' section at the end. Do these sections. They will help you with the homework.

- Intro to polynomials (5 minutes)
- Adding and subtracting polynomials by combining like terms (about 5 minutes)
- Multiplying polynomials by FOIL (about 6 minutes)
- Factoring polynomials and solving quadratics (about 10 minutes)

🙄 DO ODD NUMBERED PROBLEMS: I WILL DESKCHECK THE WORKSHEETS ON MONDAY 🙄

- Polynomial wksht 1--Simplifying & evaluating; Multiplying general distributive & FOIL
- Polynomial wksht 2--Multiplying special products
- Polynomial wksht 3--Common factoring

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## WEEK 9

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All the worksheets will come from the **\*\*Open access text\*\***

Over the weekend you did work from Sections 5.1, 5.2 and 6.1. Worksheet answers are on the following pp of this pdf:

- Polynomial wksht 1, pp 459-460 under 'Answers to Introduction to Polynomials' & Answers to Multiply Polynomials'
- Polynomial wksht 2, p 460 under 'Answers to Special Products'
- Polynomial wksht 3, pp 461-462 under 'Answers to Greatest Common Factor'

### **Monday**

- In the Open Access Text, read Ch 6, Secs 6.1-6.3 (pp 212-221). (Note that you did the Sec 6.1 worksheet already, so if you understood it fine, then you may skip this reading)
- View Factoring by grouping
- Do the fourth worksheet, p 220, Factor by Grouping (I will turn this into a worksheet from home computer, as it doesn't work in the math dept office computer)
- Go back and watch *carefully* Factoring polynomials and solving quadratics (about 10 minutes)

### **Tuesday-Wednesday**

- Remote lecture 8:30 class recording
- Posting for the second time, read Sections 6.1-6.3 (pp 212-221) in Open Access Text and do the following

worksheets:

Polynomial wksht 4--Factor by grouping

Polynomial wksht 5--Trinomial factoring, leading coeff = 1

- Don't forget that all these times are available for tutoring:

"First Year math tutoring hours"

Dan McKinney "Math Master tutoring and review sessions"

### **Thursday**

In Open Access Text do:

Poly wksht 6 -- factoring, leading coeff NOT = 1, do *odd* only

Poly wksht 7 -- Factoring special products, do all odd except #30-40

And if you like, Poly wksht 8 -- Factoring all kinds, your choice for practice

View:

- Solving quadratic equations by factoring

### **Friday-Sunday**

Do Poly wksht 9 -- Solving quadratic equations by factoring, odd only (first several are already factored)

View: Professor Dave shows how to complete the square to solve for the roots of a quadratic trinomial we can't factor (this is a replacement of the previous one; Professor Dave uses the familiar formula)

Do 1-8 in Poly wksht 10 -- Complete the square, fill in the value that completes the square

Professor Dave derives the quadratic formula for finding the roots of a quadratic equation

Do Poly wksht 11 --Solving quadratic equations by quadratic formula , odd only

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WEEK 10

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**Mon-Wed** Finishing quadratic polynomials and study for Exam 3

#### Exam 3 topics

General form of a polynomial expression in  $x$ : be able to *identify* degree and coefficients; sometimes the coefficients are zero because a term is not seen.

Given a list of expressions in  $x$ , be able to eliminate those which are NOT polynomials.

*Evaluate* polynomial expressions for a given  $x$ .



Remember, the square root of 1 is 1 and the square root of 0 is 0.

#### FACTORING:

Factoring by GCF (both numerical and variable - know the exponent rule that dividing like bases requires subtracting the exponents); factoring by trinomial factoring, factoring by grouping; factoring special products (difference of squares).

There is no factoring for a sum of squares).

Reduce a *rational expression* (which is a polynomial divided by another polynomial) by factoring them.

$$(a - b)/(b - a) = -1$$

Completing a square: find the constant to add to the x terms so you create a square of a sum or a difference.

#### SOLVING

We use the *zero product property* on the factored polynomial to find the roots of the polynomial equation. It is this: if  $AB = 0$  then either  $A = 0$  or  $B = 0$ .

Be able find the roots (*x*-intercepts, zeros) of quadratic *equations* by factoring and/or by using the quadratic formula (which comes from completing the square).

#### YOU MUST MEMORIZE THE QUADRATIC FORMULA.

General form of the quadratic polynomial equation  $y = ax^2 + bx + c$ , whose graph is a parabola.

Know that the *y*-intercept of any polynomial is simply the constant coefficient *a*o. In the case of the quadratic (parabola), it is simply the *c*.

Reducing roots after using the quadratic formula. This entails radical simplification and regular fraction reducing.

Two-term quadratics don't need to be factored. Just use the fact that if  $x^2 - c = 0$ , then  $x = \pm \sqrt{c}$ ; but if  $x^2 + c = 0$ , then no real number solution exists.

Be able to graph these simple two-term quadratics:

$y = x^2$ ,  $y = x^2 + c$ , and  $y = x^2 - c$ ; know that the first has one root, (0, 0), which is also its *y* intercept. The second has no roots, only a *y*-intercept. The third has two roots,  $x = \pm \sqrt{c}$ .

All parabolas have a *y*-intercept, but they may be lacking roots.

Go over the Lecture notes for Weeks 9 and 10 up through Tues review day. Look over the worksheets and any problems you had to do in the Kohlman text.

Practice exam 3 part 1

Practice exam 3 part 2

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WEEKEND NOV 6-7

Solving systems of linear equations! You can do this without me. It's all algebra we have done. Have at it!

- Read in Open Access Text pp 134-143
- View: Solving systems of equations by graphing, and

Solving linear systems by substitution

- Do #1-25 odd *in each set of exercises* Worksheet 12 -- Solving linear systems by graphing and substitution
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WEEK 11

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**Mon-Tues** I didn't put any hw up on Monday, my oversight!!

**Wed**

- Study for a Thursday pop quiz on long division of polynomials tomorrow!!
- View tonight, Nov 9 lecture
- Worksheet 12 - To hand in for 20 points: Find the x- and y-intercepts for #16, 20, 22 in first set; and #13, 21 and 25 in second set of Worksheet 12. *Sketch all six systems using their intercepts, and mark clearly the x and y intercepts, showing how you got these values!*

**Thursday**

- In the Kohlman text, read Ch 6, Sections 6.1 and 6.2, functions!
- Do Sec 6.2 Exercises #11-39 odd

**Friday to Sunday**

- In this Worksheet 13 -- Introduction to functions you will find several videos that precede the exercises. *View and do for Monday. There will be a desk check!*
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WEEK 12

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**Monday-Wednesday**


- Function lecture notes so far
- Watch again Domain of a function. Stop at around 13:00, the last example, which has a quadratic under a radical. We will do this in class before moving on to graphing parabolas.

So please view Prof Anil Kumar's explanation, which is given in clear, deliberative detail. He is one of my favorite internet teachers: Domain with a quadratic under a radical

- On the Worksheet 14 -- Function domain, zeroes, and intercepts, from *Algebra and Trigonometry, 3rd ed.*, by Zill & Dewar, do #1-5, #11-20, and #35-49, to be desk checked Thursday.


 ANNOUNCEMENT REGARDING TUES/THURS CLASS TIMES:

Except for Tuesday, Nov 29, Unit 4 exam day, the 8:30 class will begin at 8:45 and end the usual time, and the 10:05 class will begin at the usual time and end at 11:15. It is imperative you arrive on time for these classes!

Monday and Friday classes are at the usual times. 

On **Thursday**, we will go over Worksheets 13 and 14, so please be sure all these are done, or if you had trouble, you know which problems you want to see especially.

### **Friday-Sunday**

- Keep working on the Domain handout worksheet; the quiz Monday will be taken from this worksheet's "Mixed Practice" #19-26
-  View Writing a parabola in vertex form
- In Worksheet 15--Graphing parabolas rewrite the standard quadratic forms in vertex form, as the instructor on the video does.

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WEEK 13 THANKSGIVING WEEK

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### **Monday-Tuesday**

- View the follow up of the weekend video, now Graphing a parabola from the vertex form
- Again, in Worksheet 15--Graphing parabolas, from the vertex form you found before, graph the parabolas in the exercises
- Kiara's notes from Friday and My lecture notes from last week and Monday

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WEEK 14 Exam 4 and final topic

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 CHANGE OF EXAM DATE 

Because I never posted the worksheet and video for function composition, I must move the exam to Thursday.

View Function composition

Read the examples and do all the problems on this Worksheet 16 -- Function composition

TOMORROW IS THE FULL 85 MINUTES, so be on time, 8:30, and second class you will stay till 11:30.

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WEEKEND DEC 3-4

*This will be desk checked – intro material was covered Friday; if you were absent, seek notes from classmates*

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View Inverse functions

Read the material and do all #1-10 on Worksheet 17 -- Inverse functions

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WEEK 15

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**Monday** Do 11-39 odd, finding the inverse function in Worksheet 17 -- Inverse functions (review the video therein)

🤖 Tuesday classes will meet remotely at the link I send a few minutes before your class (8:30 and 10:05)

**Tuesday**

- View Solving exponential equations with same or related bases
- Read and do #1-10 all (and try others!) in the worksheet in this pdf: Worksheet 18--Solving exponential equations

**Thursday-Friday** This is the last homework. If you ignore it before tomorrow you will be lost. Watch the videos, read the worksheets and do the problems.

- Do #11-39 odd in Worksheet 18--Solving exponential equations
- View Logarithms explained and Converting logarithmic expressions to exponential form
- Read and do the odd exercises (as many as you can) in Worksheet 19--Evaluating logarithms and solving log equations

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Last update: **2022/12/09 00:48**

