HB5 College Prep Course Mathematics Breakout

Paper Tower Challenge

Challenge: Using only 20 pieces of paper build the tallest tower possible.

Materials: 20 pieces of 8.5” x 11” paper (standard printer paper size)

Guidelines:

1. You may use up to 20 sheets of 8.5” x 11” paper. No cardboard or card stock.
2. You may not support the structure with any materials or objects other than the 20 sheets of paper.
3. You may fold, cut, or do anything to the paper. You can use scissors to cut the paper but not to support your tower in anyway.

Let's Get to Know Each Other!

Introduce yourself.

What school do you teach at?

How long have you been teaching the College Prep course?

Access To Course Materials

https://www.esc19.net/

Gear Up

House Bill 5

House Bill 5

HB5 Math College Prep Course

HB5 English College Prep Course

Other Resources & Updates

Approved Course Resources

Textbook Options

Textbook Option 1: Martin-Gay, Elayn, 2017. Beginning & Intermediate Algebra, Pearson Education 6th Edition. ISBN: 978-0134-19309-0

Textbook Option 2: Marecek, L., & Honeycutt Mathis, A. (2020). Intermediate Algebra (2 ed.). Houston, TX: OpenStax. Retrieved from https://openstax.org/details/books/intermediate-algebra-2e

and

Marecek, L., & Honeycutt Mathis, A. (2020). Prealgebra (2 ed.). Houston, TX: OpenStax. Retrieved from https://openstax.org/details/books/prealgebra-2e

Textbook Option 1: Martin Gay and MyMathLab

RESOURCES

MATH COLLEGE PREP COURSE SEMESTER I RESOURCE NOTEBOOK REVISED 05/23/2019

MATH COLLEGE PREP COURSE SEMESTER II RESOURCE NOTEBOOK REVISED 9/23/2019

MY MATH LAB HELP

MYMATHLAB - HOW TO CREATE A COURSE

MYMATHLAB - HOW TO CREATE A HOMEWORK

MYMATHLAB- INSTRUCTOR RESOURCES

Blanca Lopez

Higher Education Sales Representative

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blanca.lopez@pearson.com

Textbook Option 2: OER NOTEBOOK & MyOpen Math

2020 COLLEGE PREP MATH NOTEBOOK

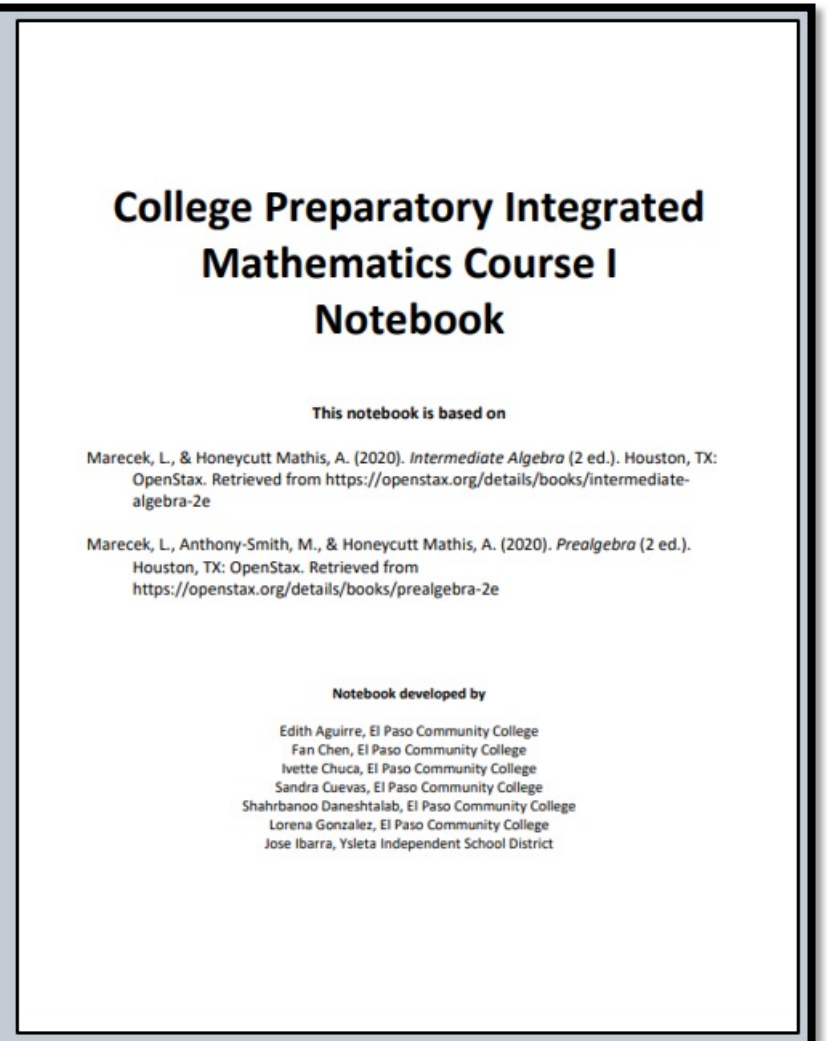
Based on OER textbooks available on

https://openstax.org/

Extra practice problems available after each section.

Homework system:

https://www.myopenmath.com/



College Preparatory Integrated Mathematics Course I Notebook

This notebook is based on

Marecek, L., & Honeycutt Mathis, A. (2020). *Intermediate Algebra* (2 ed.). Houston, TX: OpenStax. Retrieved from https://openstax.org/details/books/intermediate-algebra-2e

Marecek, L., Anthony-Smith, M., & Honeycutt Mathis, A. (2020). *Prealgebra* (2 ed.). Houston, TX: OpenStax. Retrieved from https://openstax.org/details/books/prealgebra-2e

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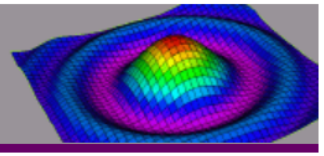
Signing Up for MyOpenMath

myOpenMath

Welcome | Student Self Study | For Instructors | LTI | About Us

Welcome



Free and Open

Students

Are you a student looking to study mathematics on your own, and want to do exercises with immediate feedback as you work through a free and open textbook? Then read more about our self study courses.

Instructors

Are you an instructor who wants to adopt an open textbook, who feels online interactive homework is valuable, but doesn't want their students to have to pay an additional fee? Then read more about using MyOpenMath in the classroom.

Getting Started

If you already have an account, you can log on using the box to the right.

If you are a new student to the system, register as a new student

If you are an instructor, you can request an instructor account

Login Error. Try Again

Login

Username:

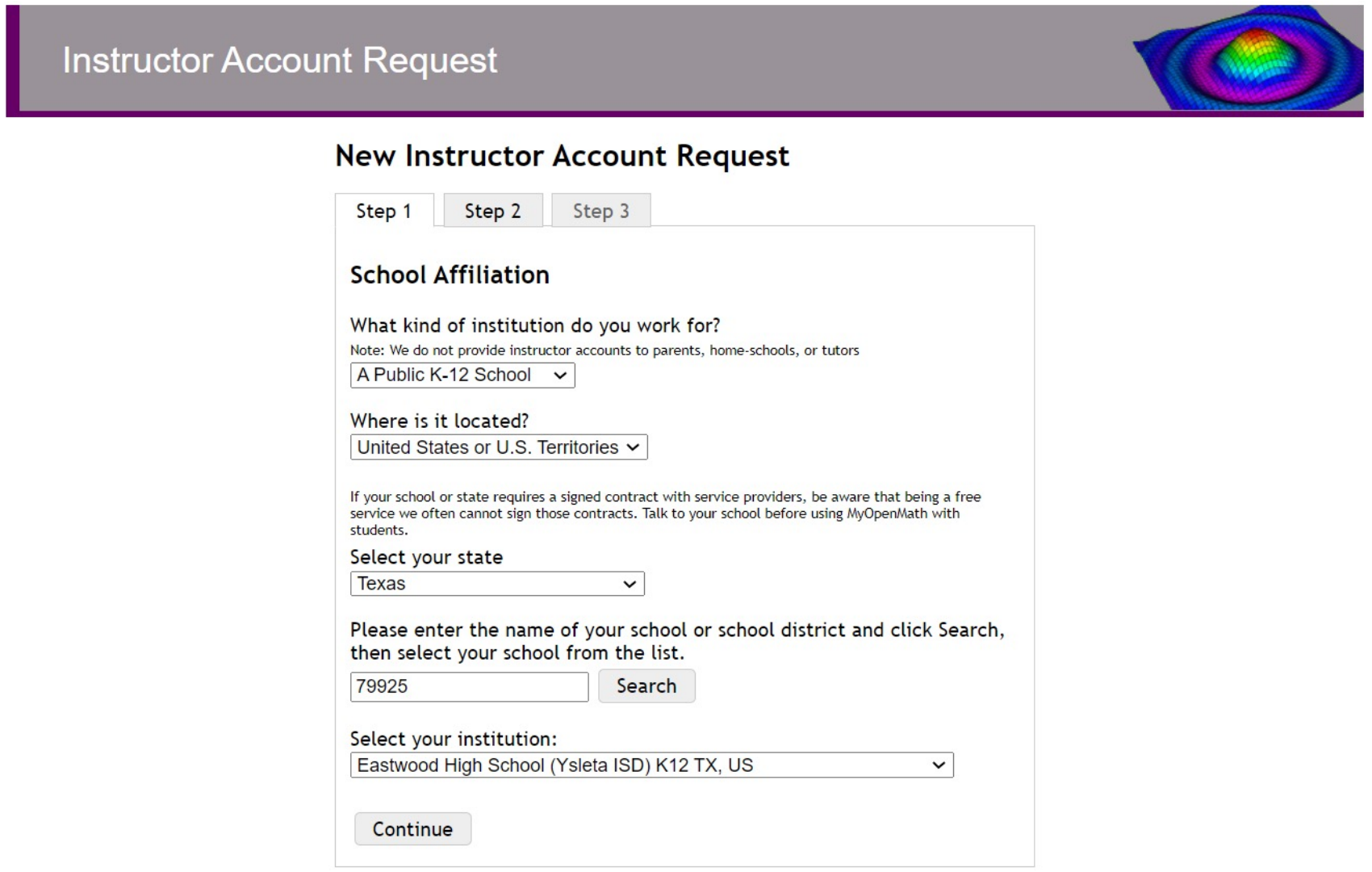
Password:

Login

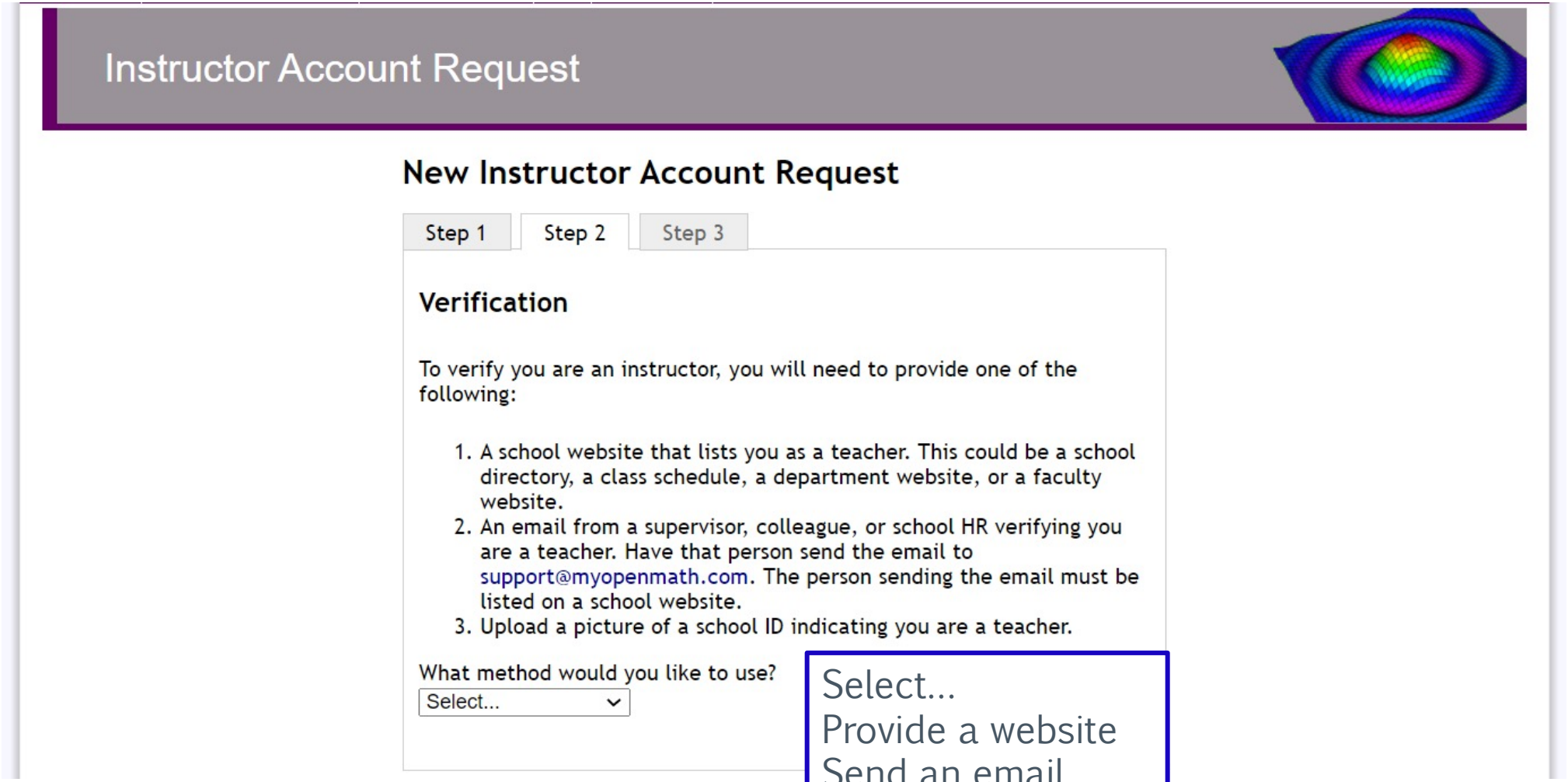
Register as a new student

Forgot Password
Forgot Username

Signing Up for MyOpenMath



Signing Up for MyOpenMath



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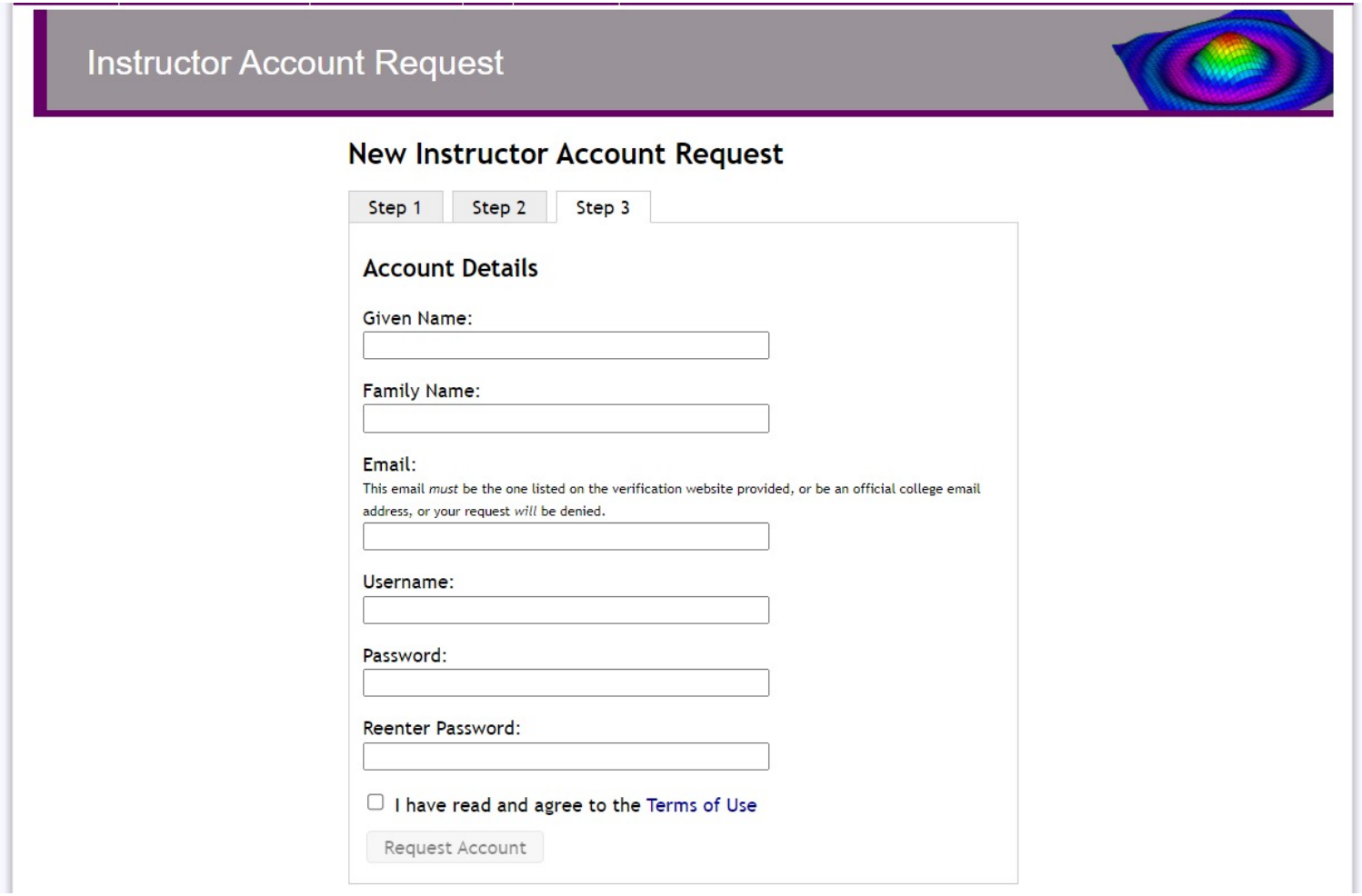
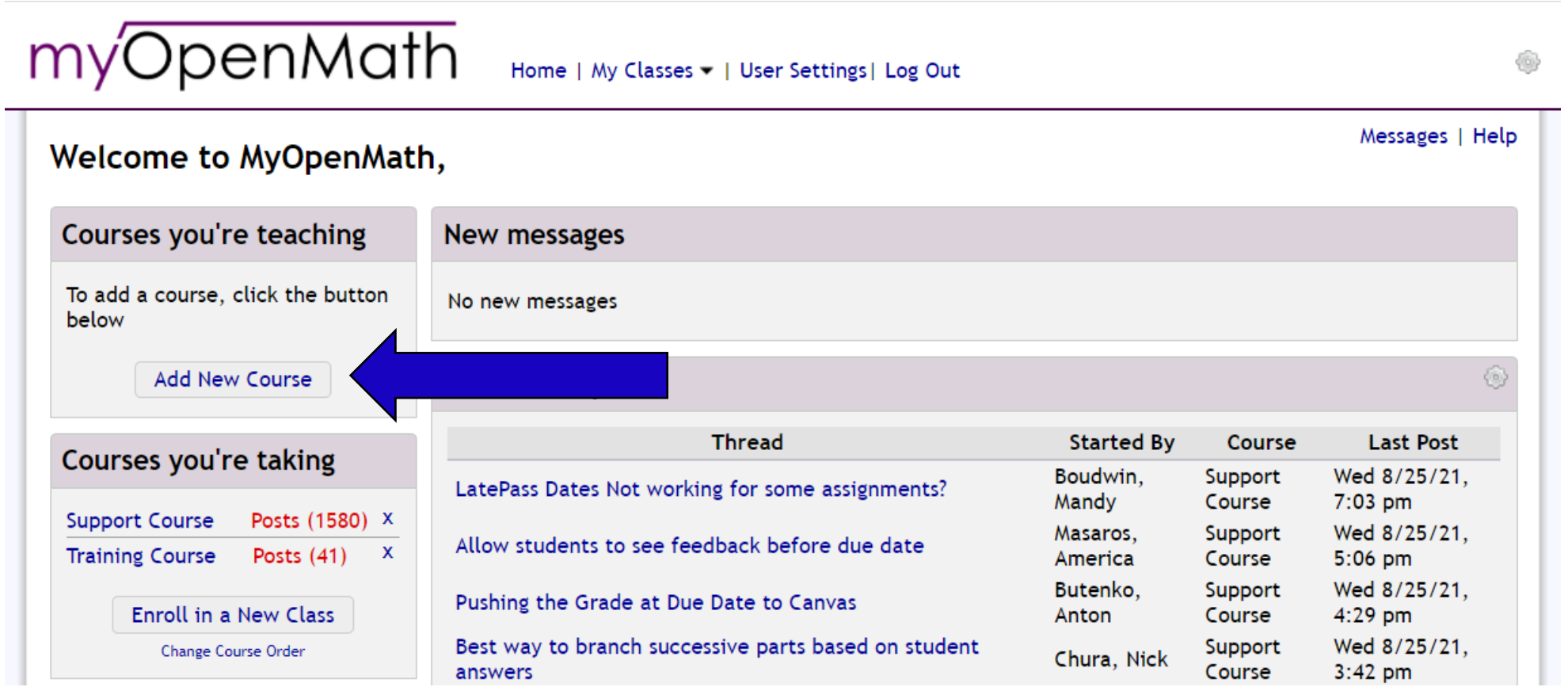


Copying HB5 Course Shell



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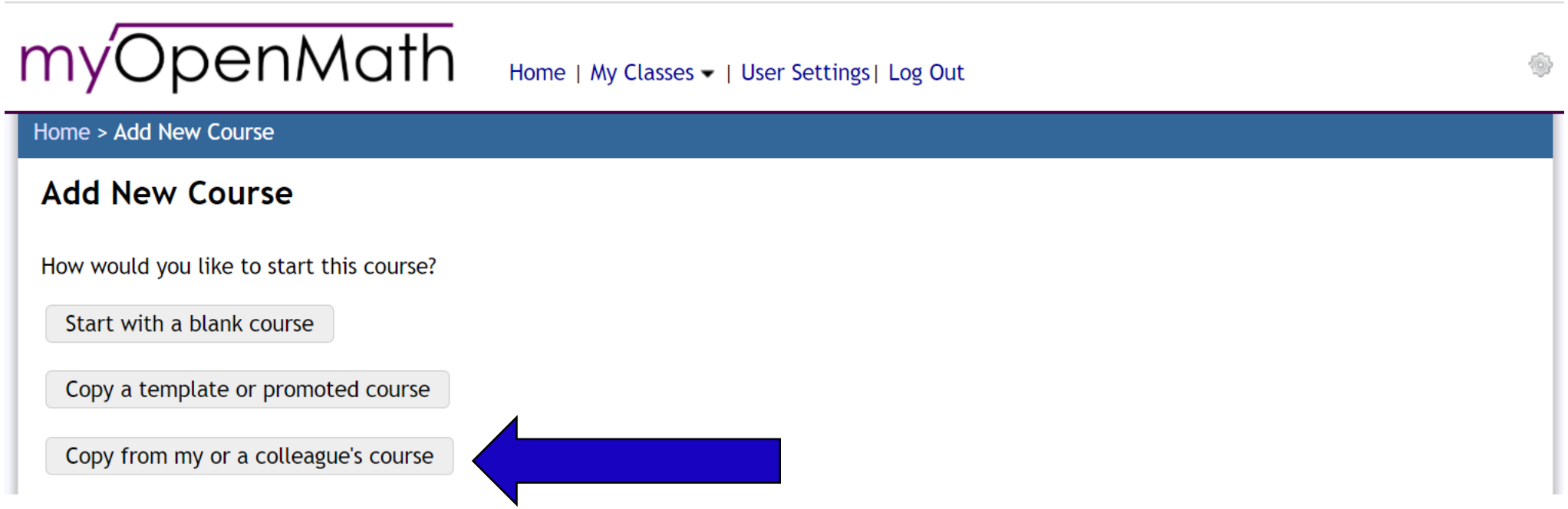

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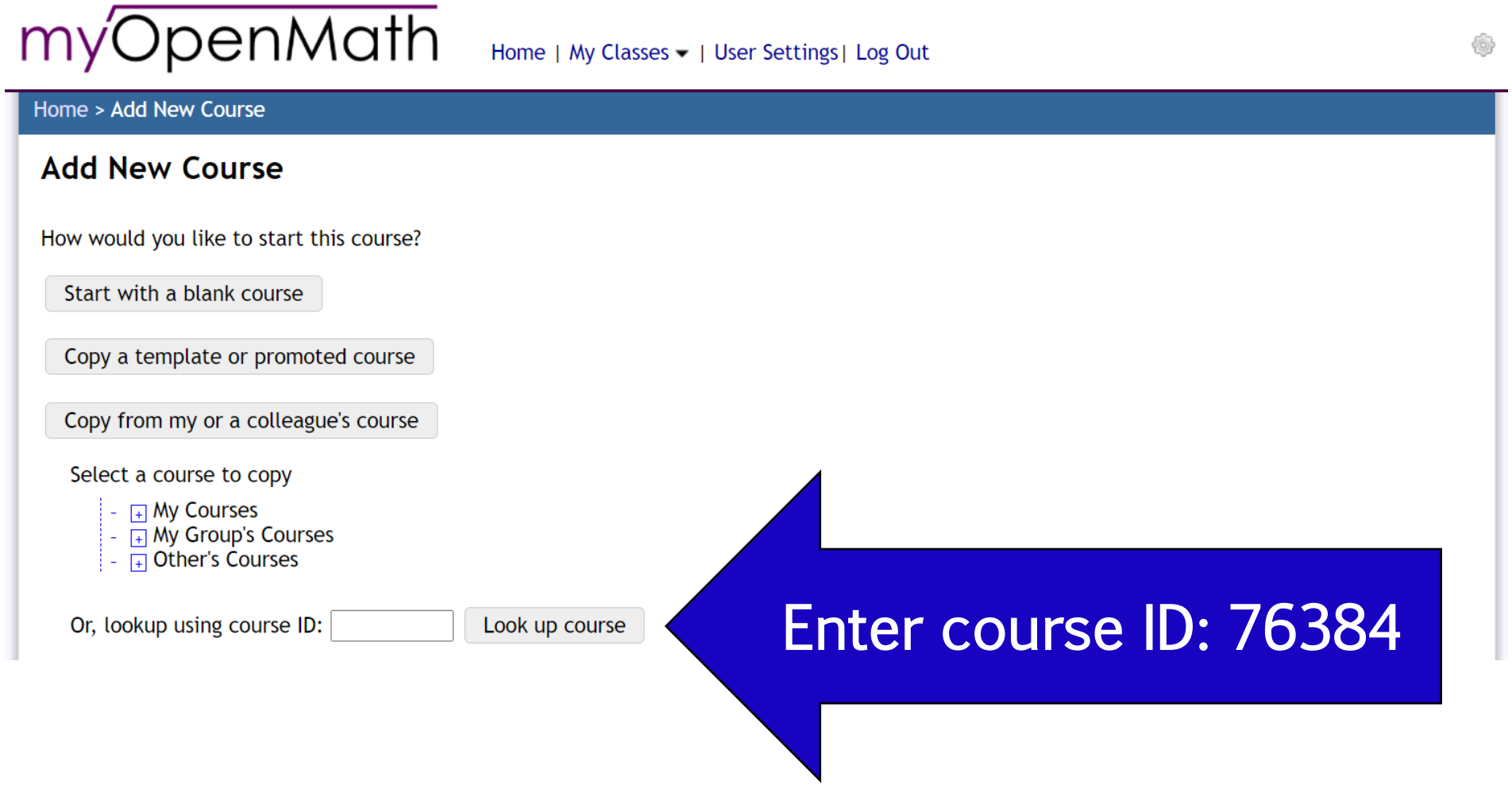

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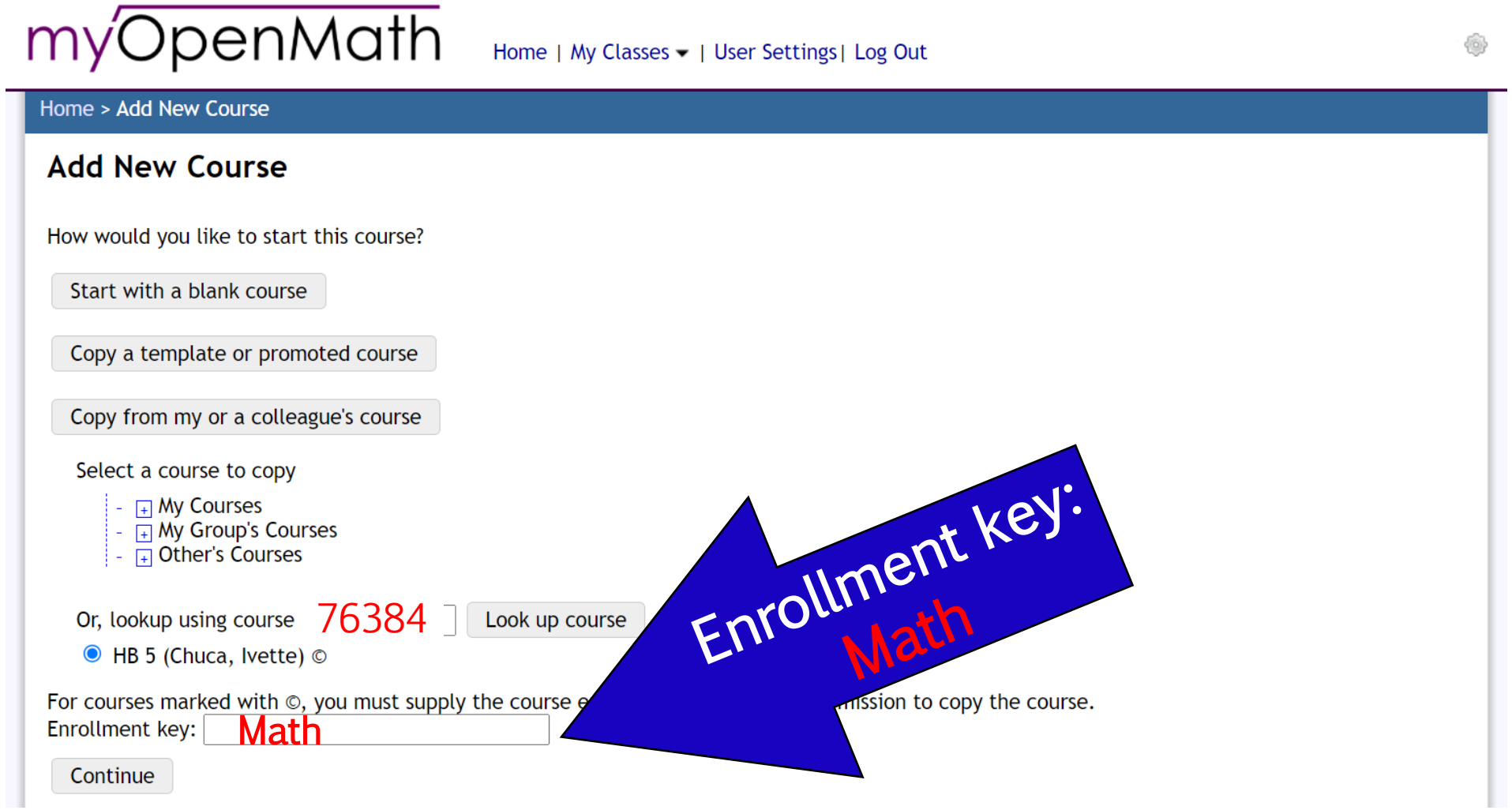

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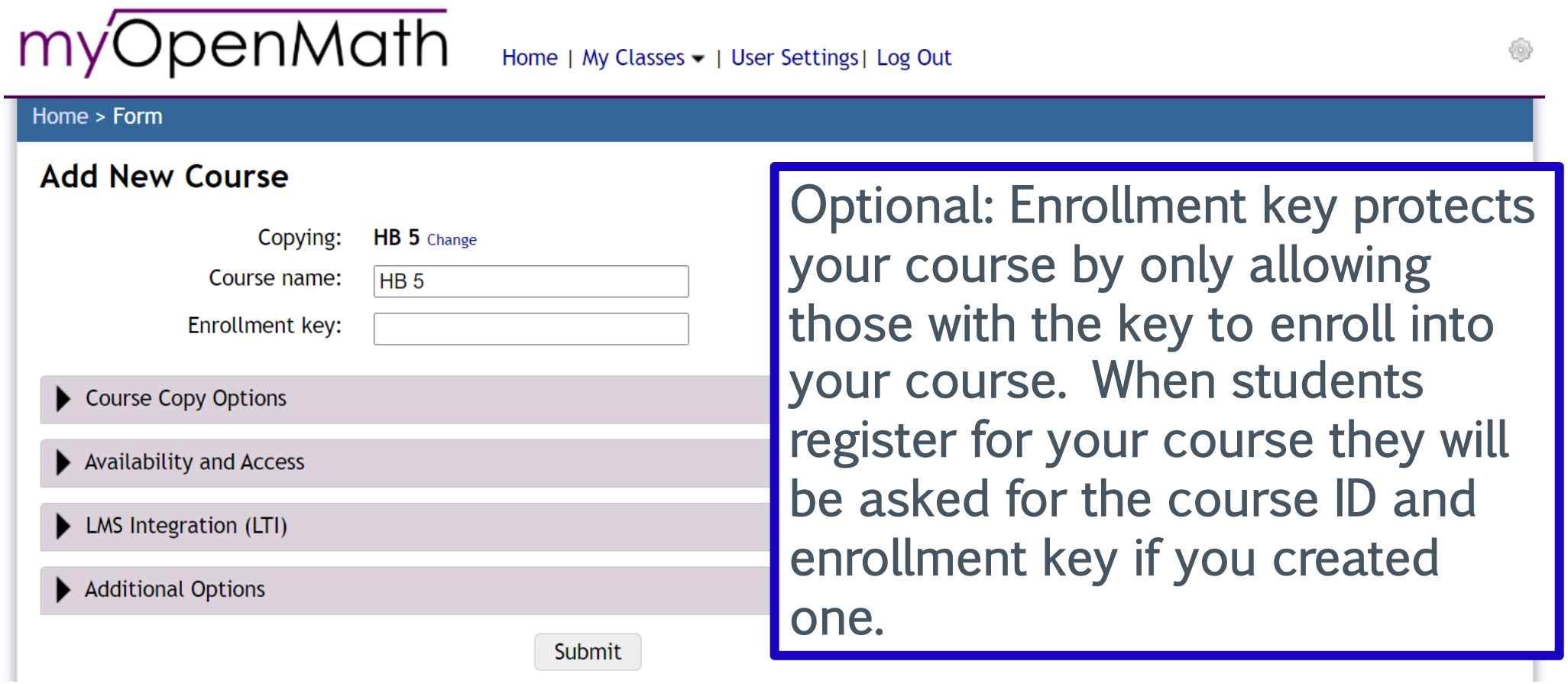

Optional: Enrollment key protects your course by only allowing those with the key to enroll into your course. When students register for your course they will be asked for the course ID and enrollment key if you created one.

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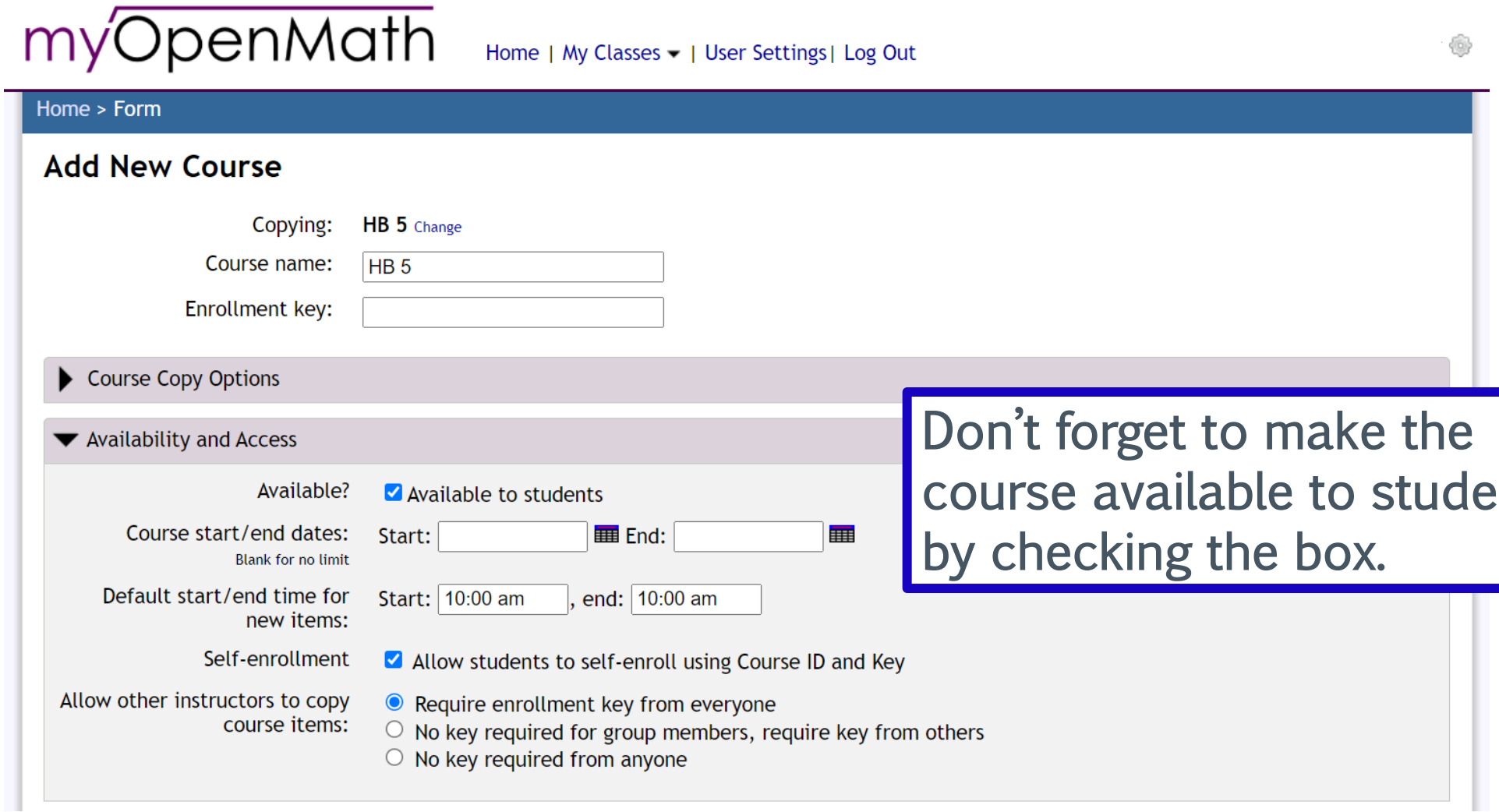
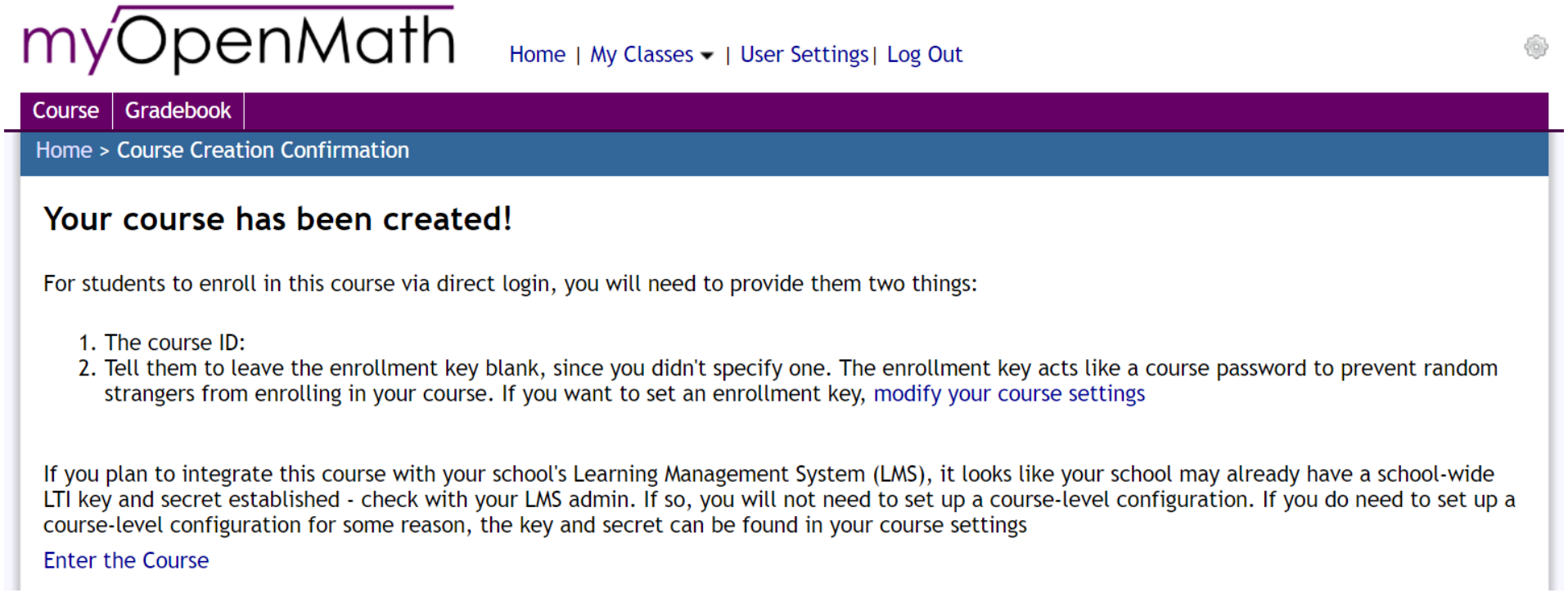
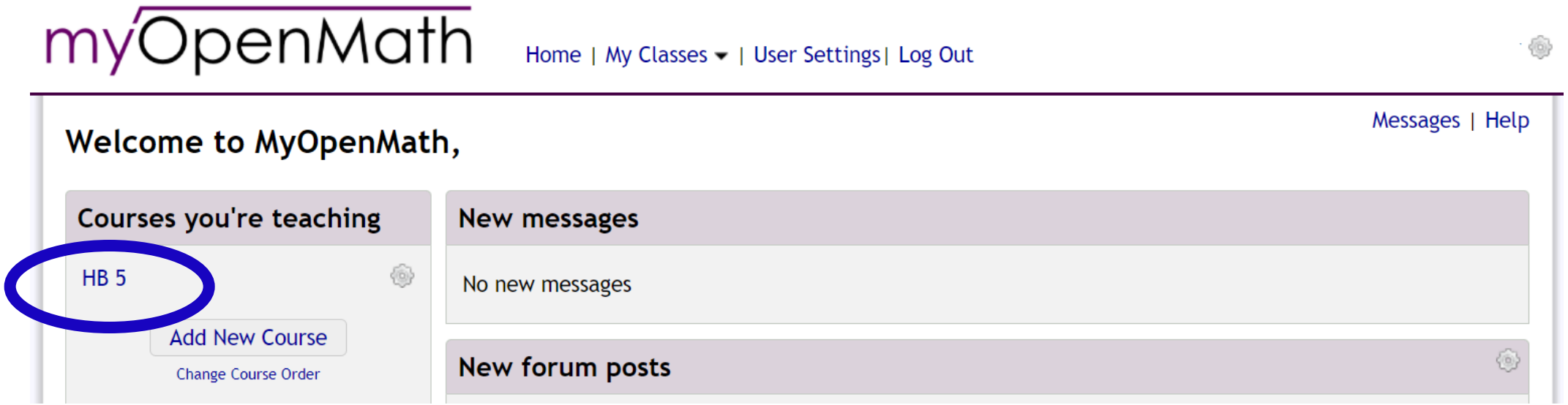


Don't forget to make the course available to students by checking the box.

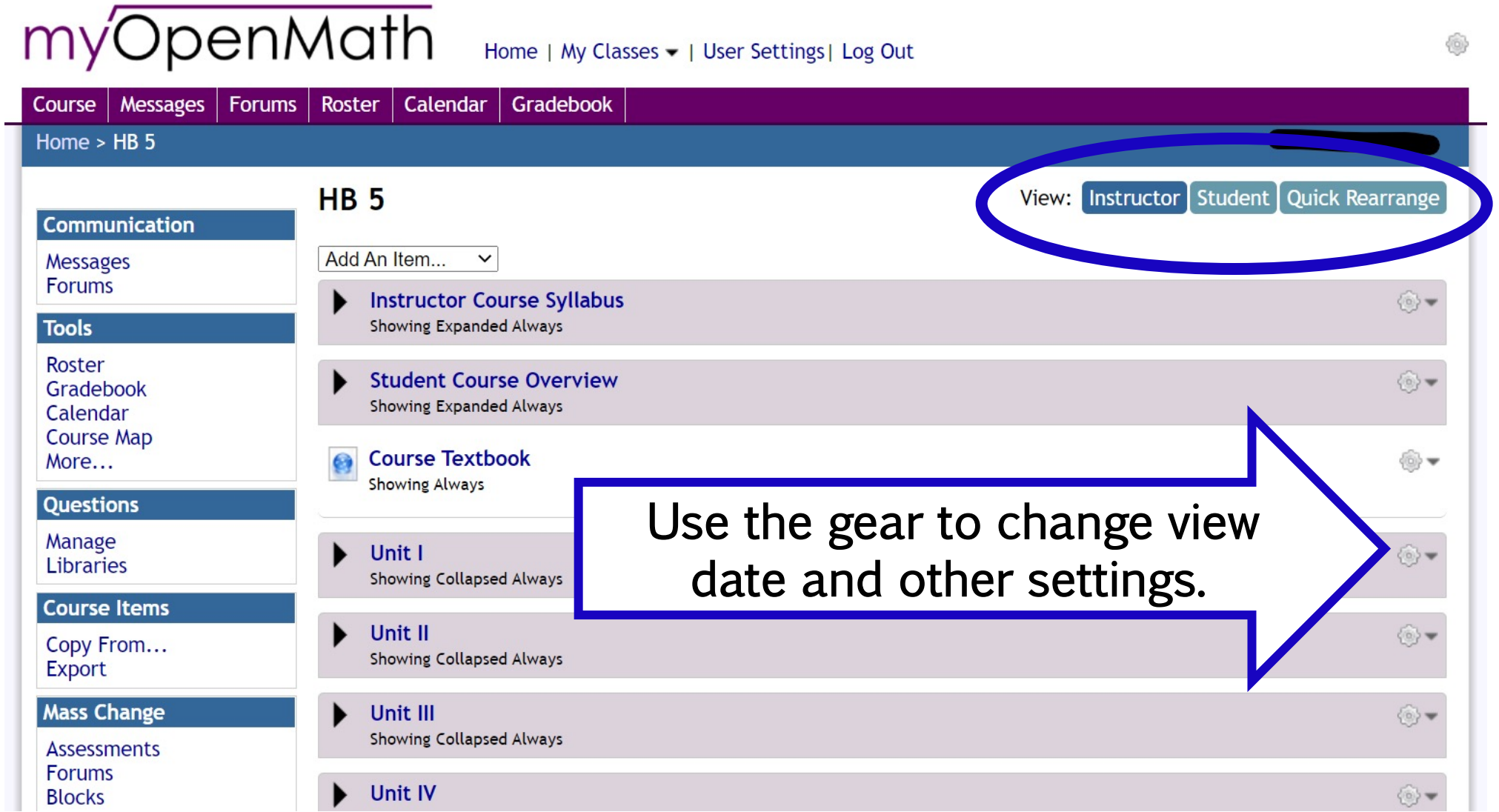
Copying HB5 Course Shell



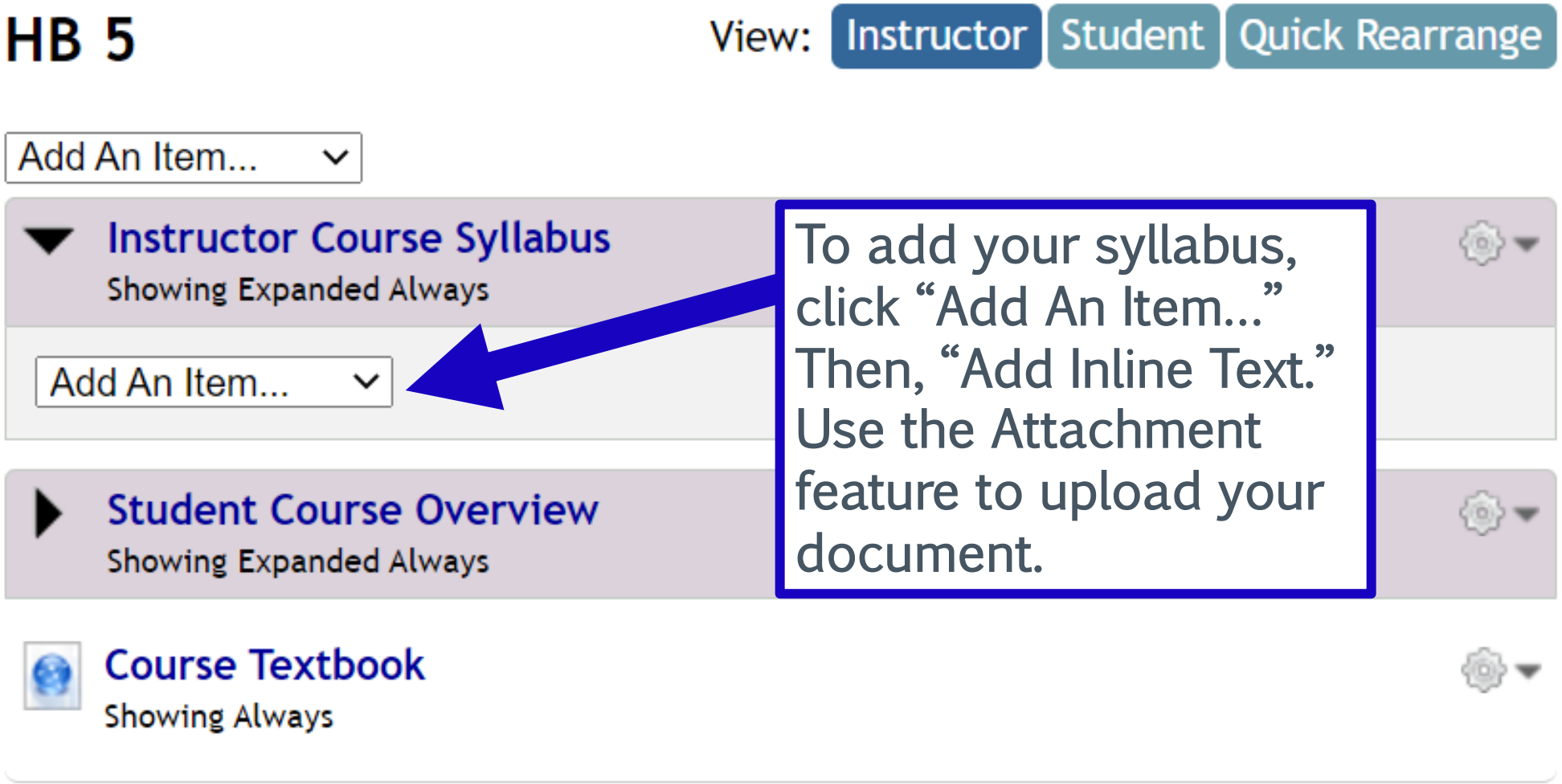
Accessing HB5 Course



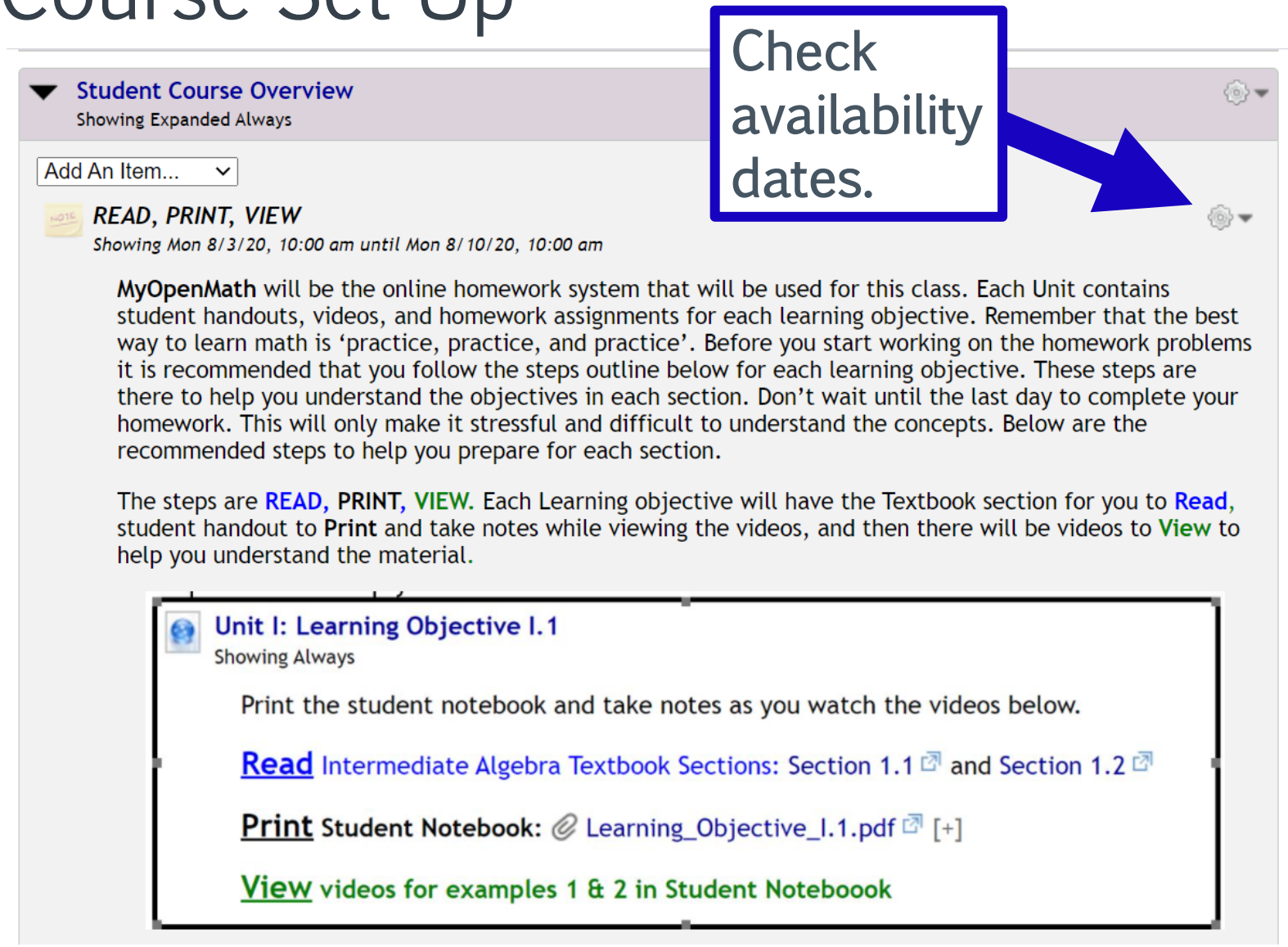
Setting Up HB5 Course



Setting Up HB5 Course



HB5 Course Set Up



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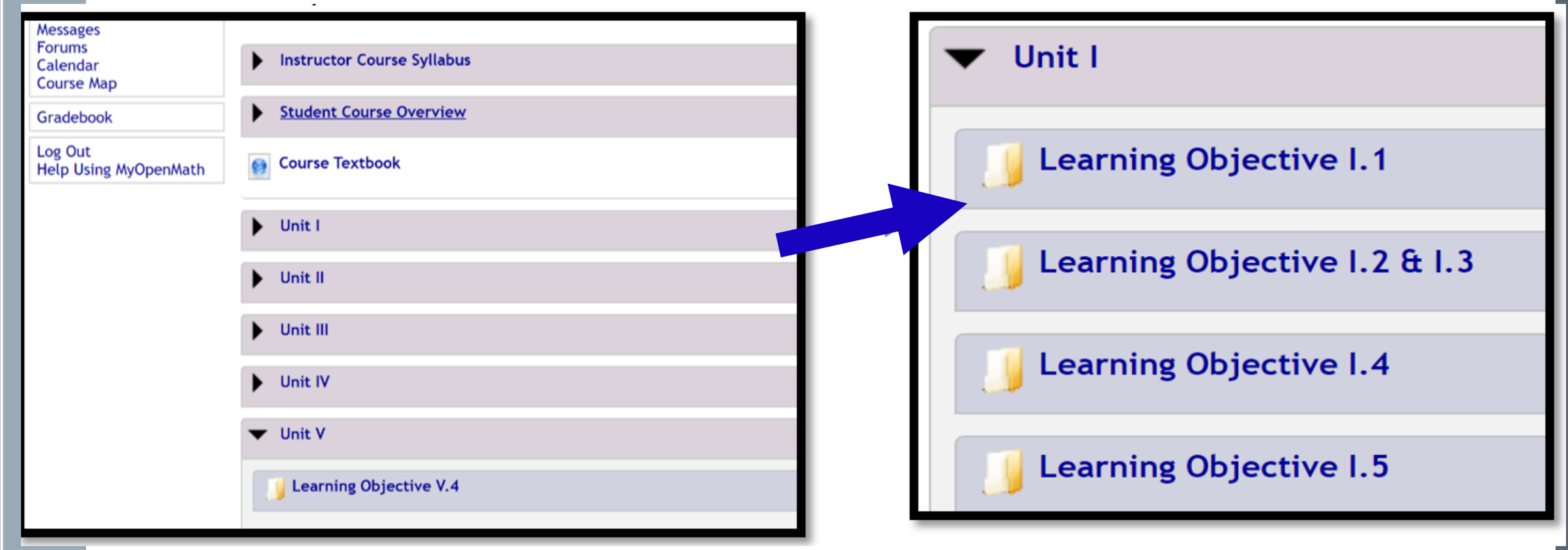
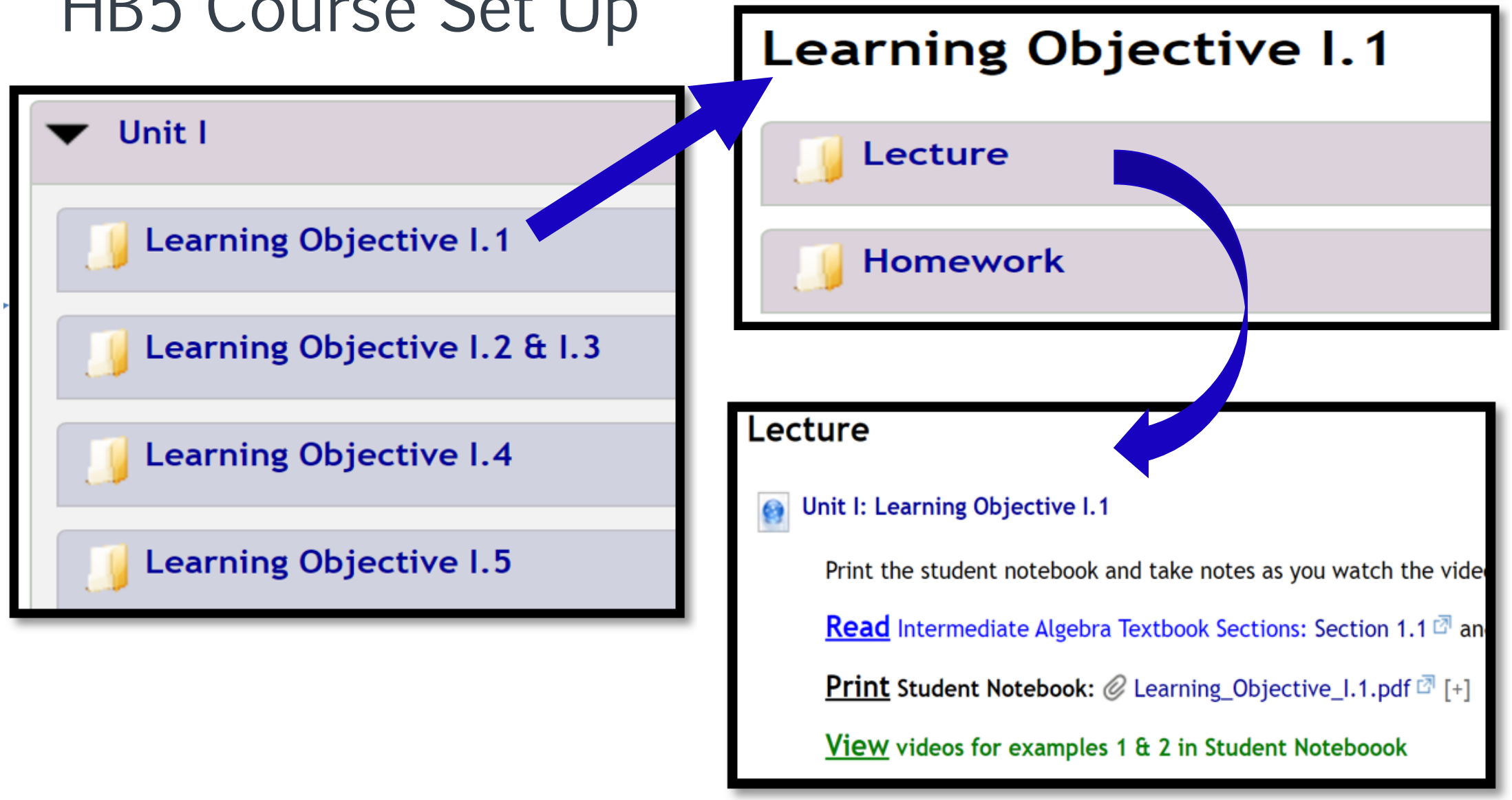
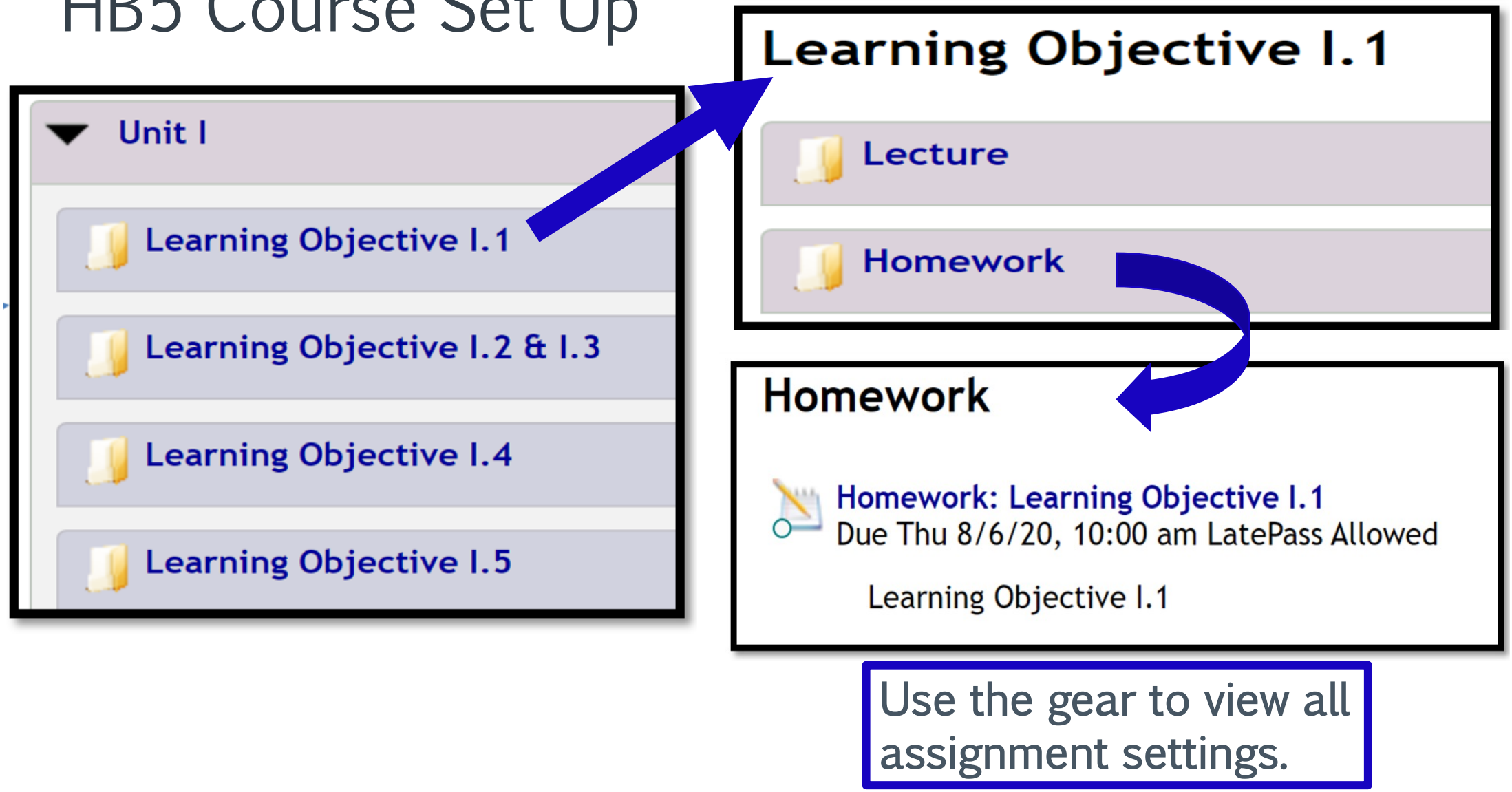


HB5 Course Set Up



HB5 Course Set Up



Use the gear to view all assignment settings.

Resources

- Approved Course Resources
- MyMathLab Help
- 2020 College Prep Math Notebook, My Open Math
- Syllabus Support Documents
- Suggested Calendars
- Additional Resources
- Sample Parent Letters

FRAMEWORKS

ESC Region 19 in partnership with EPCC and UTEP
Transition to College Math Course I – 1 Semester

College Preparatory Integrated Mathematics Course I

Target Students: This course is appropriate for 12th-grade students whose performance on measures outlined in TEC §28.014 indicates that the student is not ready to perform entry-level college coursework in mathematics. This course is designed to advance college and career readiness.

Recommended Pre-requisites: Satisfactory completion of Algebra I, Geometry, and Algebra II. Completion of the Algebra I EOC exam.

Course Description as defined by El Paso Community College and The University of Texas at El Paso:

This course addresses a variety of mathematical topics needed to prepare students for success in college-level mathematics. Also, the course supports students in developing the skills and strategies needed to succeed in college. Mathematics topics include real numbers, basic geometry, polynomials, factoring, linear equations, inequalities, rational expressions, and mathematical models with applications. Successful completion of this course (Course I and Course II), as defined by the memorandum of understanding (MOU) with the partnering institution(s), grants the student an exemption to TSI requirements for mathematics at the partnering institution(s). An overall grade for the semester of 75 or higher indicates that the student has met the college readiness standards established by the School Districts of Region 19, El Paso Community College (EPCC), and The University of Texas at El Paso (UTEP) indicating that the student is prepared for Integrated Mathematics Course II.

STUDENT LEARNING OUTCOMES	LEARNING OBJECTIVES	High School Equivalent
THE STUDENT WILL:		
1. Identify and apply properties of real numbers and perform accurate arithmetic operations with numbers in various formats and number systems. Apply basic geometric theorems and formulas.	1.1 Add, subtract, multiply and divide, using the order of operations, real numbers and manipulate certain expressions including exponential operations.	Algebra I & Geometry
	1.2 Find square roots of perfect square numbers.	
	1.3 Solve problems involving calculations with percentages and interpret the results.	
	1.4 Use estimation skills, and know why, and when to estimate results.	
	1.5 Find the perimeter and area of rectangles, squares, parallelograms, triangles, trapezoids, and circles; volume and surface area, relations between angle measures, congruent and similar triangles, and properties of parallelograms.	
	2.1 Solve problems using equations and inequalities, absolute value equalities and	
2. Demonstrate the ability to graph and solve linear equations and inequalities.	2.1 Solve problems using equations and inequalities, absolute value equalities and inequalities.	Algebra I & Algebra II
	2.2 Solving linear equations.	
	2.3 Plot ordered pairs on a rectangular coordinate system and graph linear equations.	
	2.4 Graph linear equations & linear inequalities in two variables.	
	2.5 Finding intercepts graphically and algebraically.	
	2.6 Find the slope of a line & write its equation.	Algebra I & Algebra II
3. Solve systems of equations using a variety of techniques.	3.1 Solve systems of linear equations in two variables by graphing.	
	3.2 Solve systems of linear equations in two variables by substitution.	
	3.3 Solve systems of linear equations in two variables by addition.	

4. Understand the operations of polynomial functions and solve problems using scientific notation.	4.1 Exponents	Algebra I & Algebra II
	4.2 Operations of polynomial functions to include addition, subtraction, multiplication, and division.	
	4.3 Solving problems using scientific notation.	
5. Understand, interpret, and make decisions based on financial information commonly presented to consumers.	5.1 Demonstrate understanding of common types of consumer debt and explain how different factors affect the amount that the consumer pays.	Mathematical Models with
	5.2 Demonstrate understanding of compound interest and how it relates to saving money.	
	5.3 Use quantitative information to explore the impact of policies or behaviors on a population.	Applications; Algebra I & Algebra II
	5.4 Factor polynomials using the techniques of the greatest common factor and grouping.	

Make sure all learning objectives are covered.
Final Exam is created based of the learning objectives.

FINAL EXAM AND GRADING POLICY

The students' overall grade will be calculated using the following:

- 50% of individual assessments to include a comprehensive Final Exam.
- 50% other such as daily grades, homework, etc.
- An overall grade for the semester of 75 or higher indicates that the student has met the criteria, and the student is prepared for Integrated Mathematics Course II without further assessment or remediation.

Calculator Policy

Course I: No calculators allowed.

Course II: Scientific calculators allowed.

π

Student's should be able to:

- draw on one's entire mathematical experience to figure out an appropriate next step in a problem.

- have multiple perspective on mathematical concepts.

Examples:

Function: familiar with different aspects of the idea of a function – as an equation, as a rule, as a graph, as a table, as an input-output machine – and be able to move back and forth easily among these representations.

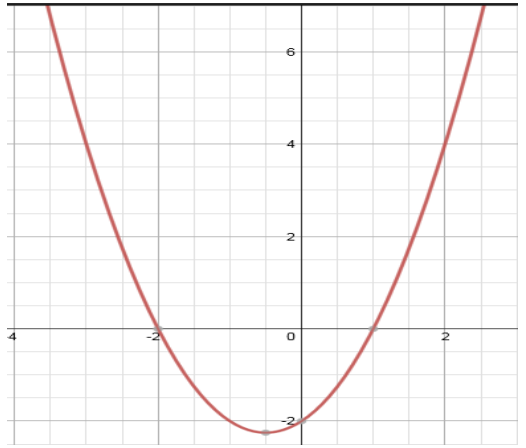
Quadratic Functions: Understanding what needs to be done to graph a quadratic function. Should also be familiar with all the names that identify solutions for quadratic functions.

Given $f(x) = x^2 + x - 2$ determine if the graph crosses the x-axis. If the graph crosses the x-axis identify where the graph crosses the x-axis.

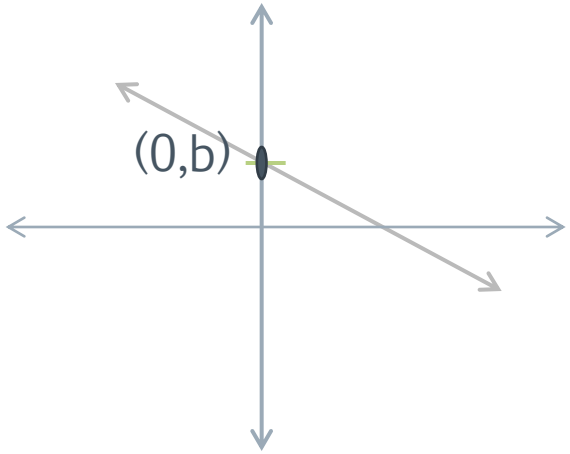
Solve $x^2 + x - 2 = 0$.

Find all the zeros of $f(x) = x^2 + x - 2$.

The graph of a quadratic function is given. Write the function's equation.



Linear Equations:
Write the equation of a line for the graph below.



$$y - y_1 = m(x - x_1)$$ Point-Slope Form

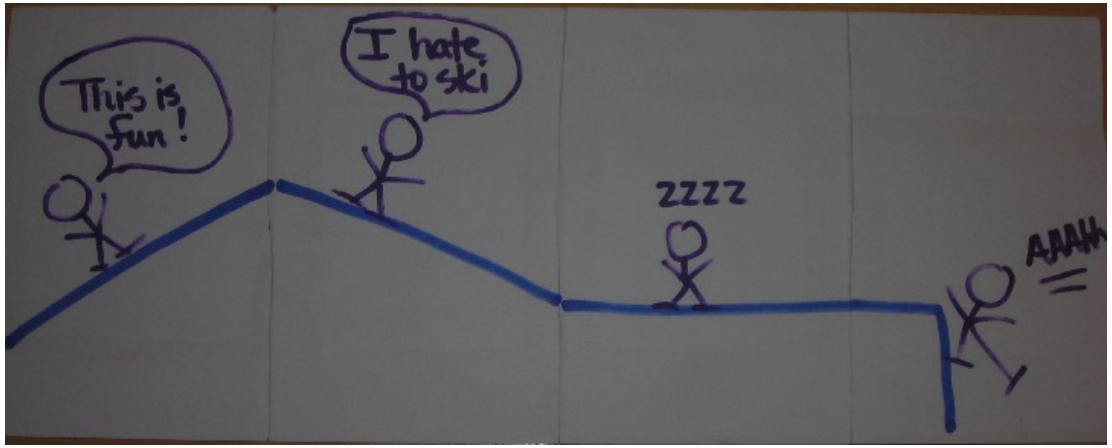
$$y - b = m(x - 0)$$

$$y - b = m(x)$$

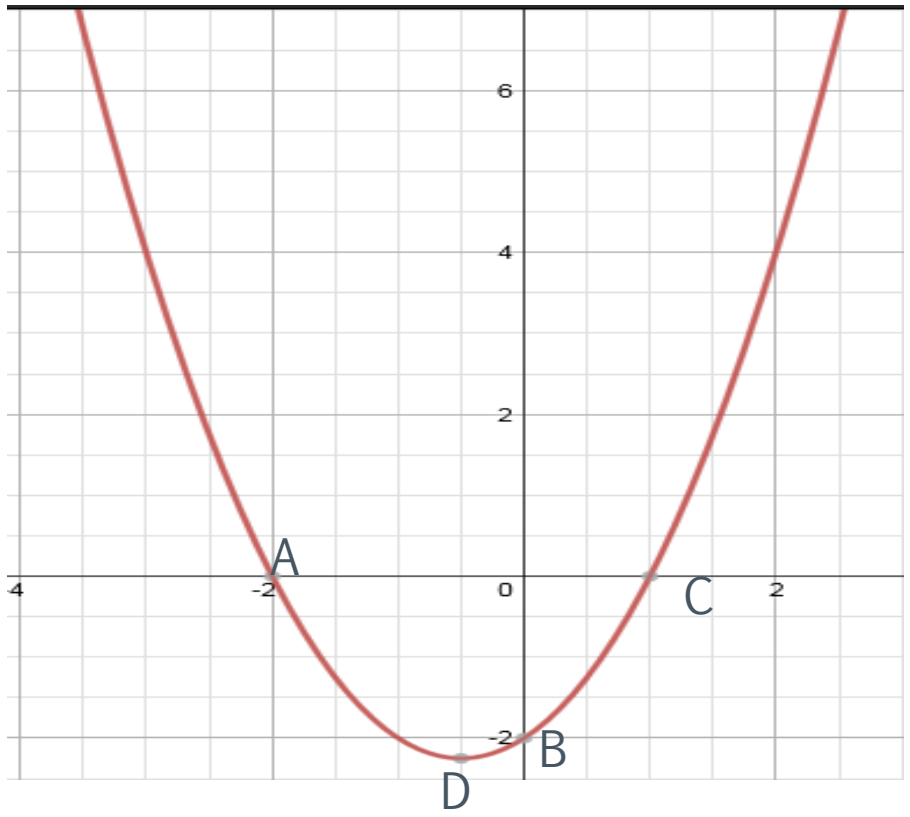
$$y = mx + b$$ Slope-Intercept Form

Hands-On Activities

1. Equations of Attack Activity Sheet
2. Linear Equations-Cut & Paste
3. Order of Operations-Bingo
4. Slope



1. Use two names used to identify point A?
2. What determines if the graph opens up or down?
3. What is point B called?
4. What is point D and how is it determined?
5. How do you know if the graph will cross or touch at point A and C?



Unit I: Factoring

1. Factoring trinomials of the form $ax^2 + bx + c$.
2. Factor the difference of two squares, perfect-square trinomials, sum and difference of two cubes and trinomials that are quadratic in form.
3. Solve equations by factoring.
4. Solve applications involving above objectives.

Factoring Example #1

Find all zeros of the following functions and give the multiplicity of each zero. State whether the graph crosses the x – axis or touches the x – axis and turns around at each zero.

$$f(x) = x^3 + 4x^2 - 3x - 12$$

Factoring Example #1 Solution

$$f(x) = x^3 + 3x^2 - 4x - 12$$

$$0 = (x^3 + 3x^2) + (-4x - 12\ )$$

$$0 = x^2(x + 3) - 4(x + 3)$$

$$0 = (x + 3)(x^2 - 4)$$

$$0 = (x + 3)(x - 2)(x + 2)$$

$x + 3 = 0$ | $x - 2 = 0$ | $x + 2 = 0$

$x = -3$ | $x = 2$ | $x = -2$

Multiplicity of 1
Crosses the x-axis at $x = -3$

Multiplicity of 1
Crosses the x-axis at $x = 2$

Multiplicity of 1
Crosses the x-axis at $x = -2$

Factoring Example #2

Find all zeros of the following functions and give the multiplicity of each zero. State whether the graph crosses the x − axis or touches the x − axis and turns around at each zero.

$$f(x) = x^4 - 9x^2$$

Factoring Example #2 Solution

$$f(x) = x^4 - 9x^2$$

$$0 = x^4 - 9x^2$$

$$0 = x^2(x^2 - 9)$$

$$0 = x^2(x - 3)(x + 3)$$

$$x = 0$$

Multiplicity of 2
Touches the x-axis and turns around at $x = 0$

$$x - 3 = 0$$

$$x = 3$$

Multiplicity of 1
Crosses the x-axis at $x = 3$

$$x + 3 = 0$$

$$x = -3$$

Multiplicity of 1
Crosses the x-axis at $x = -3$

Unit IV: Quadratic Equations and Functions, non-linear inequalities

1. Understand and use the root square property, completing the square, and quadratic formula to solve quadratic equations.
2. Solve equations that are quadratic in form.
3. Solve nonlinear inequalities.
4. Graph quadratic functions using points, x- intercepts, and the vertex.
5. Solve applications using above objectives.

Quadratic Example #1

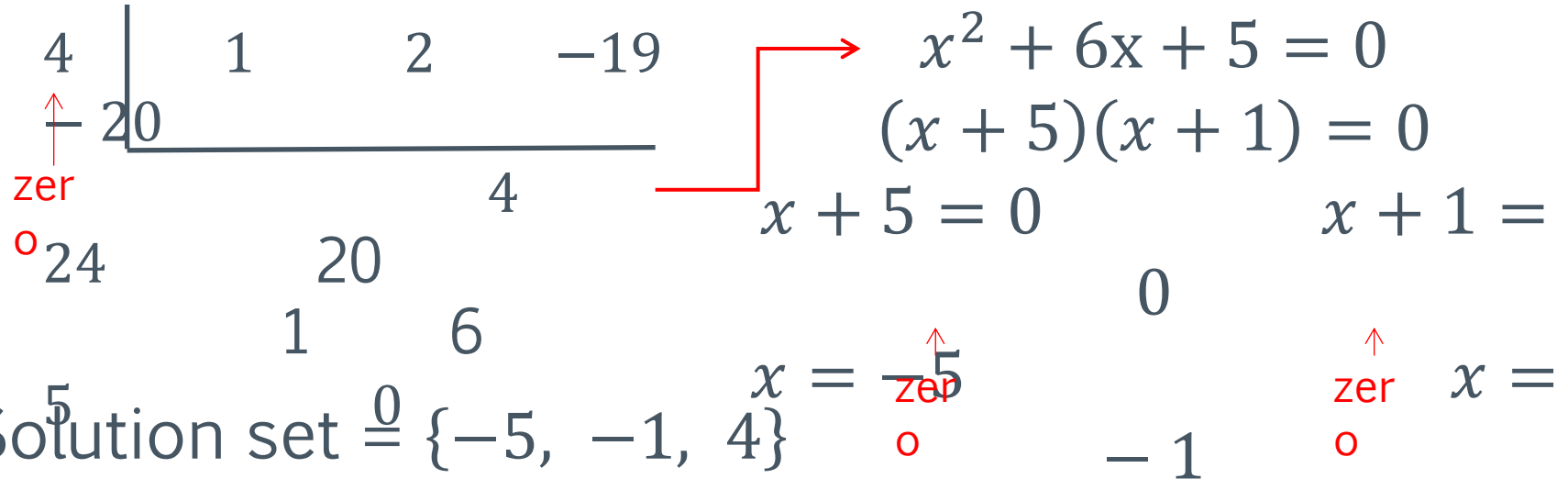
Find all the zeros of the function.

$$f(x) = x^3 + 2x^2 - 19x - 20$$

Quadratic Example #1 Solution

$$f(x) = x^3 + 2x^2 - 19x - 20$$
$$0 = x^3 + 2x^2 - 19x - 20$$

Possible Rational Zeros $= \pm 1, \pm 2, \pm 4, \pm 5, \pm 10, \pm 20$



Solution set $= \{-5, -1, 4\}$

Quadratic Example #2

Find all the zeros of the function.

$$f(x) = x^3 + 3x^2 - 24x - 26$$

Quadratic Example #2 Solution

$$f(x) = x^3 + 3x^2 - 24x - 26$$
$$0 = x^3 + 3x^2 - 24x - 26$$

Possible Rational Zeros $= \pm 1, \pm 2, \pm 13, \pm 26$

-1	1	3	
zero → -24	-26		
		-1	
-2	26		
	1	2	
-26	0		

$x^2 + 2x - 26 = 0$

$$x = \frac{-(2) \pm \sqrt{(2)^2 - 4(1)(-26)}}{2(1)} = \frac{-2 \pm \sqrt{4 + 104}}{2}$$
$$= \frac{-2 \pm \sqrt{108}}{2} = \frac{-2 \pm 6\sqrt{3}}{2}$$

$$x = \frac{-2+6\sqrt{3}}{2} \qquad x = \frac{-2-6\sqrt{3}}{2}$$
$$x = -1 + 3\sqrt{3} \qquad x = -1 - 3\sqrt{3}$$

zero zero

Solution set $= \{-1,\ -1 + 3\sqrt{3},\ -1 - 3\sqrt{3}\}$

Quadratic Example #3

Find all the zeros of the function.

$$f(x) = x^4 - 6x^3 - 3x^2 + 24x - 4$$

Quadratic Example #3 Solution

$$f(x) = x^4 - 6x^3 - 3x^2 + 24x - 4$$
$$0 = x^4 - 6x^3 - 3x^2 + 24x - 4$$

Possible Rational Zeros $= \pm 1, \pm 2, \pm 4$

	2	1	−6	−3	24
		−4			
			2	−8	
−2	2	4			
			1	−4	−11

zero

	−2	1	−6	−2	12
		−2			
			1	−8	
−2	2	4			
			1	−4	0

zero

$$x^2 - 6x + 1 = 0$$

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(1)}}{2(1)} = \frac{6 \pm \sqrt{36 - 4}}{2}$$

$$= \frac{6 \pm \sqrt{32}}{2} = \frac{6 \pm 4\sqrt{2}}{2}$$

$$x = \frac{6+4\sqrt{2}}{2} \qquad x = \frac{6-4\sqrt{2}}{2}$$

$$x = 3 + 2\sqrt{2} \qquad x = 3 - 2\sqrt{2}$$

zero zero

Solution set $=$

$$\{2, -2, 3 + 2\sqrt{2}, 3 - 2\sqrt{2}\}$$

Domain

3 Questions:

1. Are there fractions containing a variable in denominator?
2. Are there square roots containing variable in the radicand?
3. Are there logarithms?

No to all the above → Domain is all real numbers

Domain Example

Find the domain of the functions.

a. $f(x) = x + 3$

b. $f(x) = \sqrt{4x - 1}$

c. $f(x) = \dfrac{5}{x + 2}$

d. $f(x) = \log_5(3x + 45)$

Domain Example Solutions

a. $f(x) = x + 3$

Function has no fraction.

Function has no square root.

Function has no logarithm.

Domain: $(-\infty, \infty)$

Domain Example Solutions

b. $f(x) = \sqrt{4x - 1}$

Function has no fraction.

Function has no logarithm.

Function has a square root.

$$4x - 1 \geq 0$$

$$x \geq \frac{1}{4}$$

Domain: $\left[\frac{1}{4}, \infty\right)$

Domain Example Solutions

c. $f(x) = \frac{5}{x+2}$

Function has no square root.

Function has no logarithm.

Function has a fraction.

$$x + 2 = 0$$
$$x \neq -2$$

Domain: $(-\infty, -2) \cup (-2, \infty)$

Domain Example Solutions

d. $f(x) = \log_5(3x + 45)$

Function has no fraction.

Function has no square root.

Function has a logarithm.

$$3x + 45 > 0$$
$$x > -15$$

Domain: $(-15, \infty)$

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Questions?

REMIND

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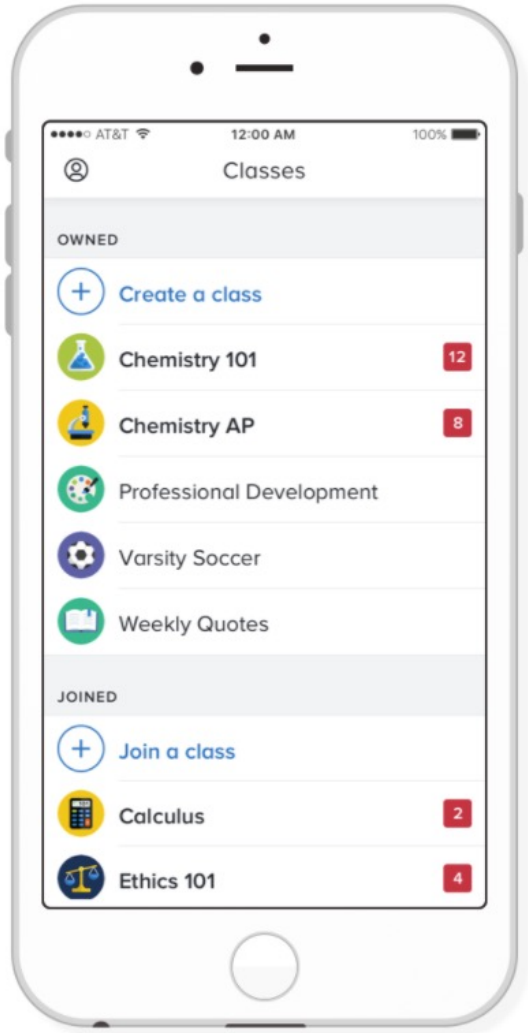
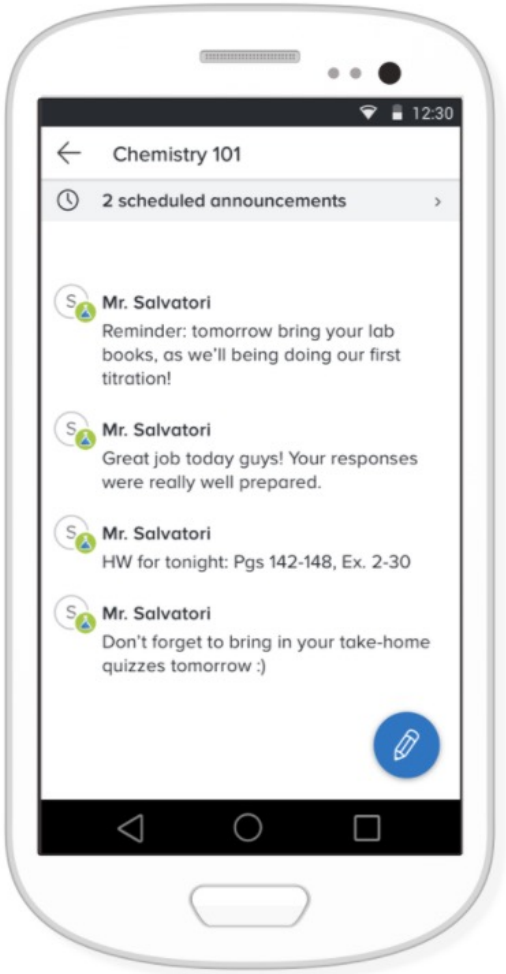
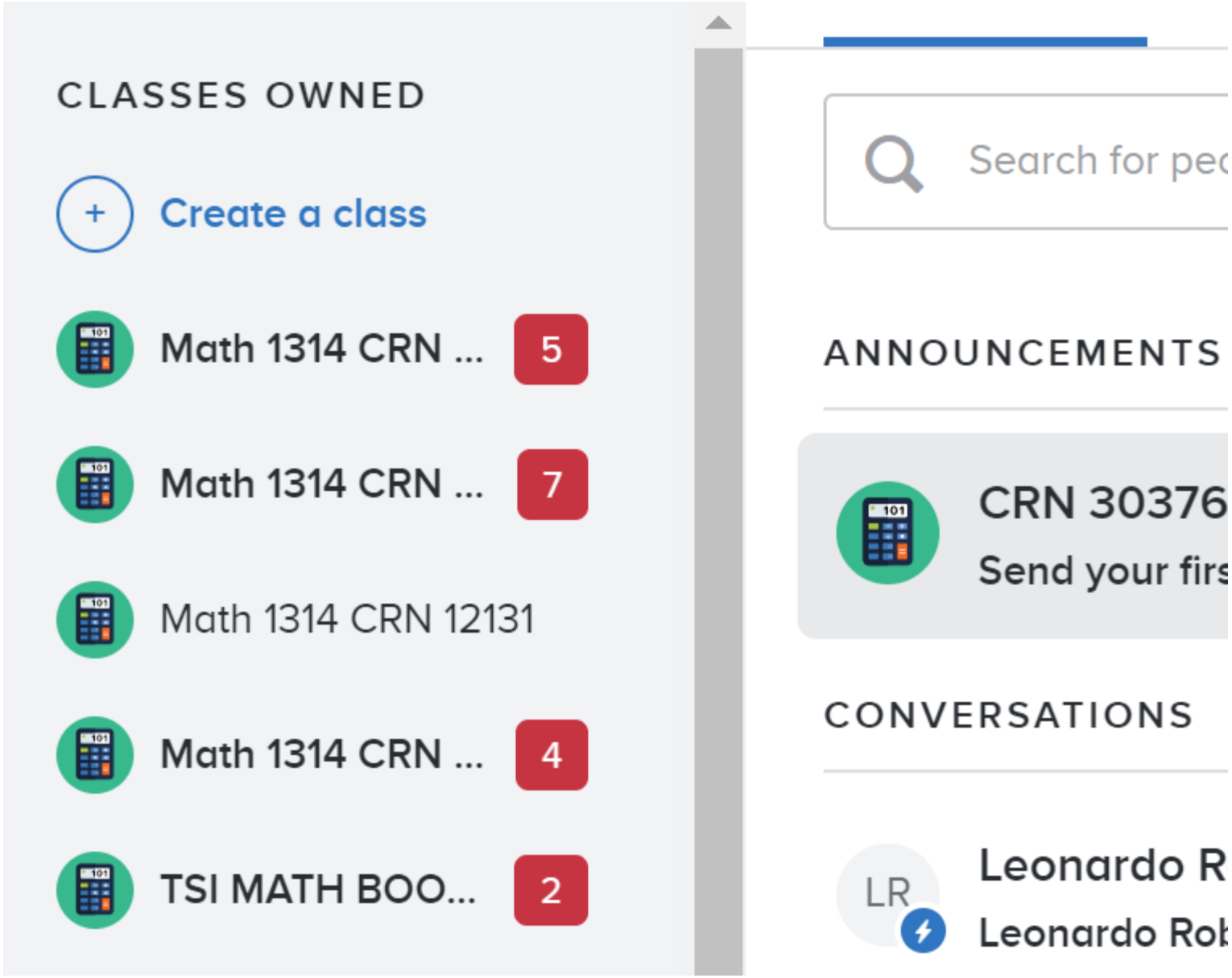
remind Schools & Districts Higher Ed Teachers Families Partners

Reach students and parents *where they are*





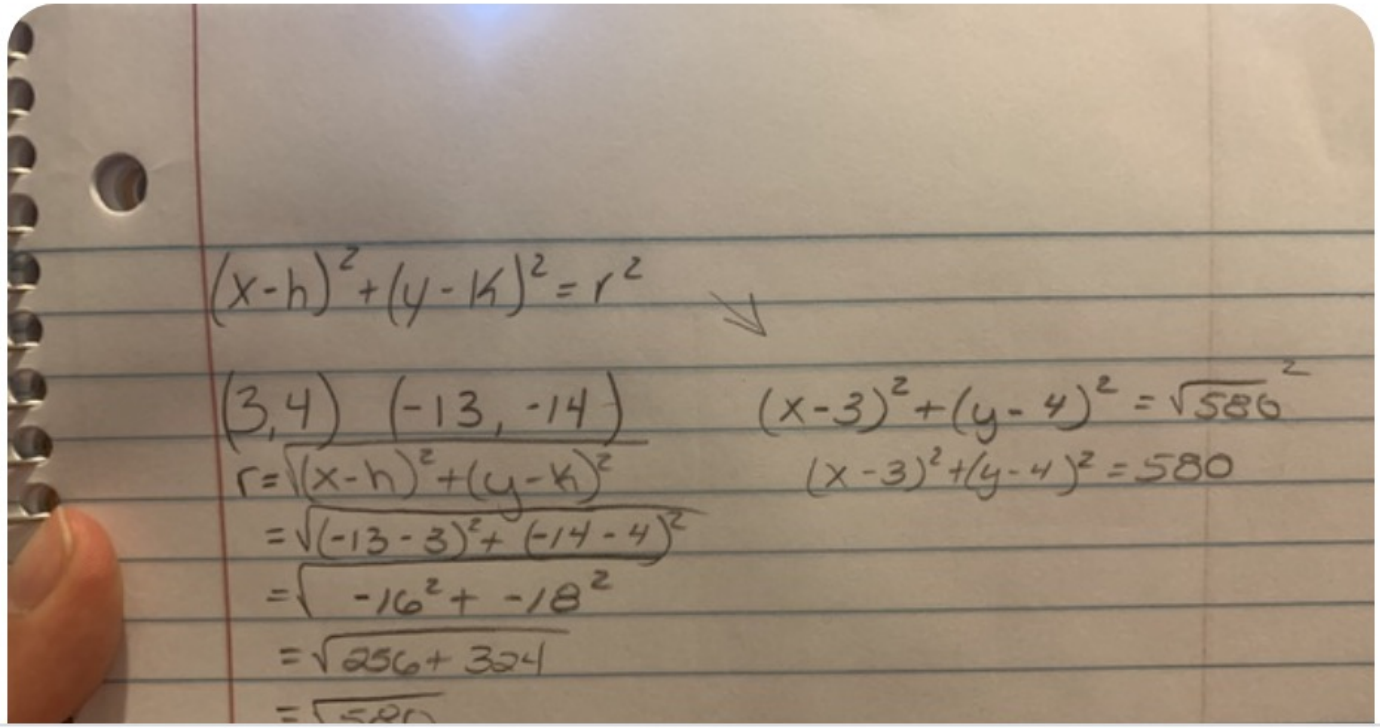

CLASSES OWNED
Create a class
Math 1314 CRN ...
5
Math 1314 CRN ...
7
Math 1314 CRN 12131
Math 1314 CRN ...
4
TSI MATH BOO...
2
Search for pe
ANNOUNCEMENTS
CRN 30376
Send your firs
CONVERSATIONS
LR
Leonardo R
Leonardo Rob

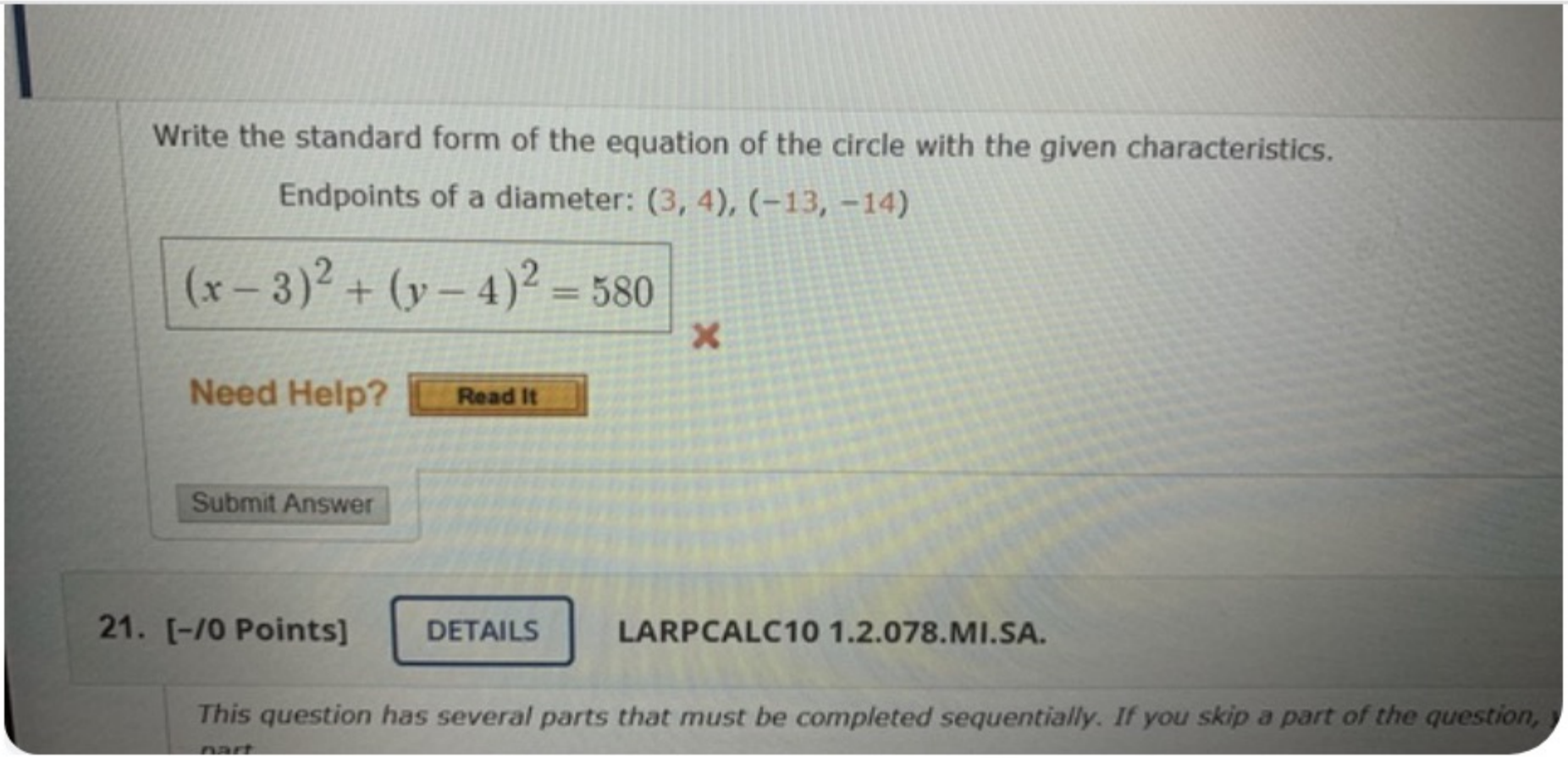
Remind Example

[redacted]

Student

[redacted]





YR

I'm sorry. I don't understand this problem.

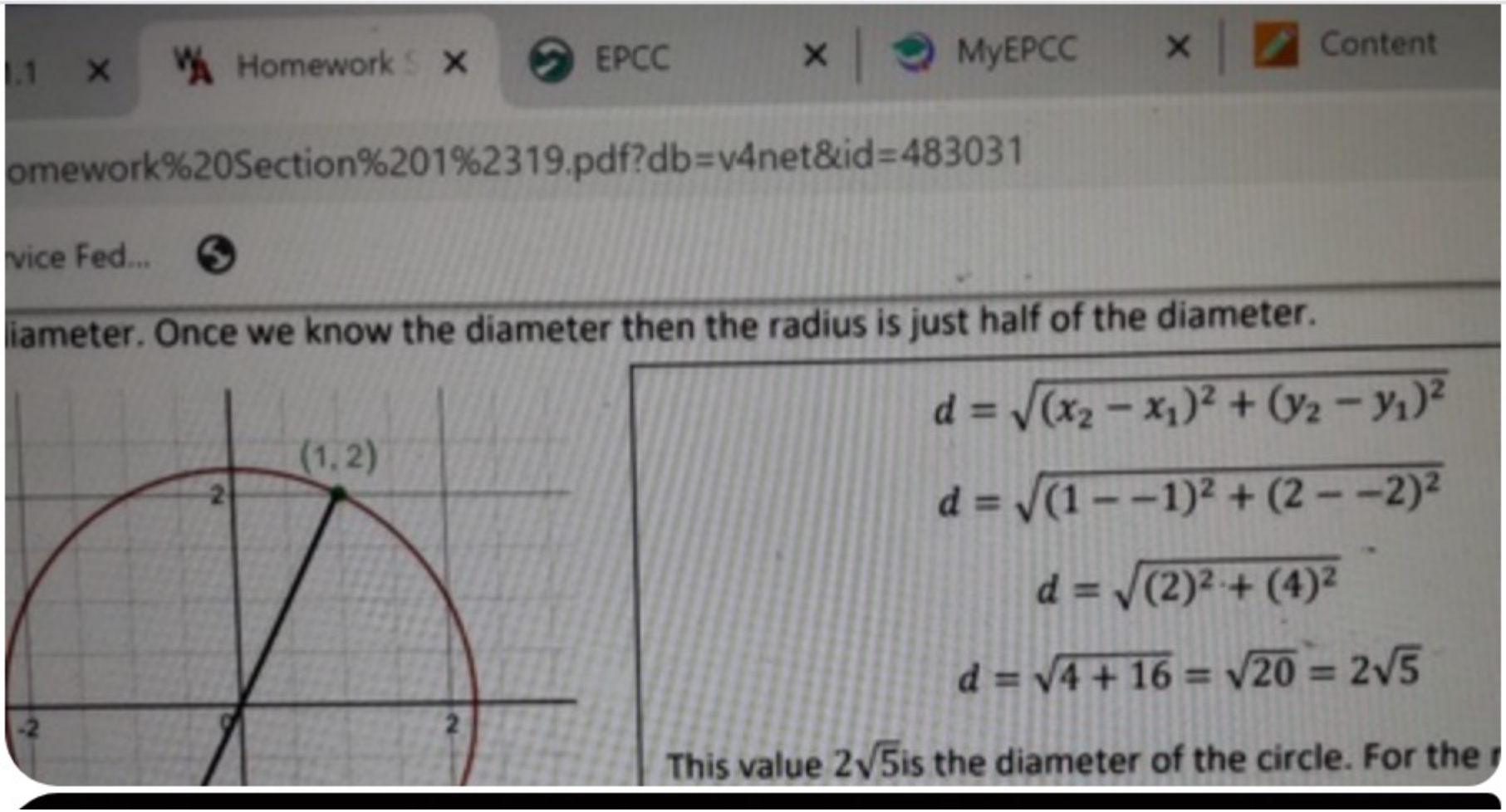
Instructor Response

Hello. Did you see the step by step example that I posted on webassign. Its section 1.2 #19. You can find it under the announcements in webassign.

Basically since they give you the endpoints of a diameter you want to first use the distance formula with those points.

Once you have the distance you take half because the radius is half of the diameter

To get the center of the circle you want to find the midpoint of


Homework
EPCC
MyEPCC
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omework%20Section%201%2319.pdf?db=v4net&id=483031
vice Fed...
iameter. Once we know the diameter then the radius is just half of the diameter.
(1, 2)
2
-2
0
2
$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
$d = \sqrt{(1 - -1)^2 + (2 - -2)^2}$
$d = \sqrt{(2)^2 + (4)^2}$
$d = \sqrt{4 + 16} = \sqrt{20} = 2\sqrt{5}$
This value $2\sqrt{5}$ is the diameter of the circle. For the