


WeBWorK-Blackboard Integration


Blackboard supports the Learning Tools Interoperability (LTI) protocol that can connect WeBWorK to Blackboard. You create an "Assignment/Link" on Blackboard providing an URL of the WeBWorK course to be connected. The only additional step you need to take in this process is setting up the grade in Blackboard.

Faculty login and content linking

Instructor' login

Instructors, TAs, and professors access and manage their WeBWork courses as usual as before the WeBWork-Blackboard integration. For accessing and managing their course, they use the WeBWork front page <http://webwork.qcc.cuny.edu/webwork2>.

 WeBWorK

 MAA
MATHEMATICAL ASSOCIATION OF AMERICA

webwork / test_LTI

test_LTI

Please enter your username and password for **test_LTI** below:

Username:

Password:

Continue

Site Information

QCC Math Department

Welcome to the QCC WeBWorK server.

Students: If you are unable to log in, please contact your instructor.

Instructors: For information or technical assistance, please contact one of the system's administrators or email to webwork@qcc.cuny.edu.

In the LTI's default configuration of WeBWorK, accounts for users with roles of TA or higher are NOT created via Blackboard. The instructors' accounts are manually created in WeBWorK by the system's administrators, as it has been done since the system was implemented at QCC.

Instructors, professors, and TAs cannot access WeBWorK via Blackboard. If a user in one of these roles attempts to login into WeBWorK via Blackboard, the following error message appears.

WeBWorK error

An error occurred while processing your request. For help, please send mail to this site's webmaster (webwork@qcc.cuny.edu), including all of the following information as well as what you were doing when the error occurred.

Fri Jul26 10:28:01 2019

Warning messages

[illegible]

Error messages

The instructor account with user id 10840814 does not exist. Please create the account manually via NetWork. at /opt/webwork/webwork2/lib/NetWork.pm line 321.

Call stack

The information below can help locate the source of the problem.

- In `Carp::croak` called at line 515 of `/opt/webwork/webwork2/lib/libWebWork/Authen/LTIAdvanced.pm`
- In `libWebWork::Authen::LTIAdvanced::create_user` called at line 426 of `/opt/webwork/webwork2/lib/libWebWork/Authen/LTIAdvanced.pm`
- In `libWebWork::Authen::LTIAdvanced::authenticate` called at line 310 of `/opt/webwork/webwork2/lib/libWebWork/Authen/LTIAdvanced.pm`
- In `libWebWork::Authen::LTIAdvanced::verify_normal_user` called at line 385 of `/opt/webwork/webwork2/lib/libWebWork/Authen.pm`
- In `libWebWork::Authen::isg_verify` called at line 236 of `/opt/webwork/webwork2/lib/libWebWork/Authen.pm`
- In `libWebWork::Authen::isg_verify` called at line 321 of `/opt/webwork/webwork2/lib/libWebWork.pm`

Account doesn't exist
because Bb doesn't
not create it

Request information

Instructors can use the “Student Preview” mode in Blackboard to access the links to assignments in WeBWorK. This way, a student account is created in WeBWorK for them, and they will be allowed to log in to WeBWorK via Blackboard as any student would.

For security reasons, the cut-off at the TA level for creating LTI-based accounts is to prevent instructors with LMS access from posting links on Blackboard with a WeBWorK URL to courses they do not manage. Thus, preventing them from adding themselves (and potentially their students) to somebody else’s course. With the default cut-off to TA, the worst case is that an unauthorized student WeBWorK account gets created for the course by a faculty using “Student Preview.”

Content linking in Blackboard

1) Enable LTI in Blackboard

By default, Blackboard already has WeBWorK available as a tool. But if it is not, the instructor can go to “Customization” in the Blackboard menu and click on “Tool Availability.” Then scroll down and make sure the box in the **QCC WeBWorK** row (in the “Available” column) is checked.

QBCC_PlayPosit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
QCC ALEKS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
QCC VoiceThread LTIOne	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
QCC WeBWorK	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Check this box


2) Create an assignment

Instructors create assignments in WeBWorK as usual. For more information about this, check https://github.com/bsosnovski/WeBWorK/blob/master/Getting_Started_with_WeBWorK_for_QCC_Faculty.pdf

The summary of the steps in creating an assignment in WeBWorK is as follows:

- Name the new assignment (e.g., MA-LTI-PNT3_Orientation).
- Select the questions/problems to be part of the assignment.
- Set dates for when the assignment opens and closes and when the answers will be available.
- Make the assignment visible.

The last two steps are shown below.


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< webwork / test_lti / instructor tools / hmwk sets editor / Set Detail 2 for set MA-LTI-PNT3_Orientation

Set Detail 2 for set MA-LTI-PNT3_Orientation

This set **MA-LTI-PNT3_Orientation** is assigned to all students.
 Edit [individual versions](#) of set MA-LTI-PNT3_Orientation.

Any changes made below will be reflected in the set for **ALL** students.

Save Changes
 Reset Form

General Information		
Opens	06/25/2019 at 11:59pm	
Closes	07/26/2019 at 03:59pm	
Answers Available	07/28/2019 at 11:59pm	
Visible to Students	Yes	Make the assignment visible
Hide Hints from Students	No	
Assignment type	homework	

Set dates

Set Description

3) Linking the assignment in Blackboard

Once a WeBWorK assignment is ready, the instructor needs to link the assignment in Blackboard for students to access them in WeBWorK.

- Go to the content area where you want the assignment link to appear.
- Then Build Content > Web Link.
- Add a name for the assignment.
- Add the URL of the assignment you are linking to. (The URL looks like this:
<http://webwork.qcc.cuny.edu/webwork2/CourseName/Assignment>)
- Check the box "This link is a Tool Provider."
- Enable Evaluation and make it visible to students.
- Set the number of points (same as in WeBWorK)
- (Optional but recommended) Set the due date in Blackboard.
- (Recommended) Set the link to open the assignment in a new window.

Example:

A valid link for linking an assignment looks like

http://webwork.qcc.cuny.edu/webwork2/test_LTI/MA-LTI-PNT3_Orientation

Note:

Visibility and due dates of assignments are not automatically synchronized, and changing these in WeBWorK doesn't alter them automatically in Blackboard. It is recommended that instructors also set due dates in Blackboard and allow WeBWorK to control the availability of the assignments.

Edit Web Link

A Web Link is a shortcut to a Web resource. Add a Web Link to a Content Area to provide a quick access point to relevant materials. [More Help](#)

* Indicates a required field.

WEB LINK INFORMATION

* Name

* URL
For example, <http://www.myschool.edu/>

☒ This link is to a Tool Provider. [What's a Tool Provider?](#)

Enable Evaluation ☒ Yes ☐ No

To set additional evaluation options, use the Column settings in the Grade Center

* Points Possible

Visible to Students ☒ Yes ☐ No

Due Date
Enter dates as mm/dd/yyyy. Time may be entered in any increment.

Now everything is set and ready for the students.

Note: Instructors must ensure that grading is enabled for the link and that the total number of points for the assignment is also set.

Use 100 points so that the grade looks like a percentage. However, the grade given to the student will always be a percentage of the total available points, so any number of points can be used.

The following shows assignment links created in the content area “WeBWorK LTI.”

The screenshot shows the 'WeBWorK LTI' content area. At the top, there are navigation tabs: 'Build Content', 'Assessments', 'Tools', and 'Partner Content'. Below these, there are three assignment links, each with a globe icon and a dropdown arrow:

- WeBWorK Orientation**: Enabled: Statistics Tracking. Assignment with Introduction to WeBWorK.
- WeBWorK HW 1**: Enabled: Statistics Tracking. First homework assignment.
- WeBWorK HW 2**: Enabled: Statistics Tracking. Second homework assignment.

Grade sync

The LTI configuration in WeBWorK is set to return the total score for each assignment to Blackboard. In other words, instructors will see multiple columns in the Blackboard Grade Center, one for each link/assignment, which will be filled out with students' scores on individual WeBWorK assignments.

WeBWorK will attempt to update student grades every time students submit an answer to a problem, and this keeps the student's grades current. One possible downside of this feature is that it can drain our QCC WeBWorK server.

Below is an illustration of the corresponding columns created in the Grade Center based on the abovementioned assignments. These columns will be filled with scores as students access the assignments using the links provided in Blackboard.

The screenshot shows the 'Grade Center : Full Grade Center' view. At the top, there is a description: 'The Full Grade Center displays all columns and rows in the Grade Center and is the default view of the Grade Center. [More Help](#)'. Below this are navigation tabs: 'Create Column', 'Create Calculated Column', 'Manage', 'Reports', 'Filter', 'Discover Content', and 'Work Offline'. The main area displays a table with the following columns:

	LAST NAME	FIRST NAME	INTRODUCTIO NS	WEBWORK ORIENTATION	WEBWORK HW 1	WEBWORK HW 2
Selected Rows: 0						

At the bottom right, there are buttons for 'Move To Top', 'Email', 'Icon Legend', and 'Edit Rows Displayed'. The table is sorted by 'Layout Position' in 'Ascending' order.

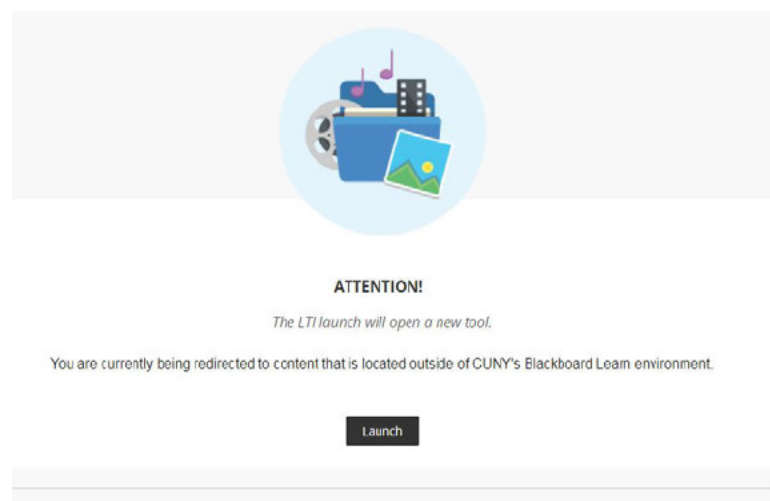
Testing the system as a student

Student's login

With the WeBWorK-Blackboard integration via LTI, Blackboard automatically creates students' accounts in WeBWorK. A password will not be required from the students to access WeBWorK. Students are automatically assigned to all visible homework sets.

Students' accounts created via Blackboard will not have either a student ID or an initial password in WeBWorK, and students will not be able to login into WeBWorK directly. There is only one way for students to log in, and they must log in to Blackboard and select a WeBWorK assignment.

Students see the link(s) to their WeBWorK assignment(s) in the Content area in Blackboard. They will use the link(s) to access the WeBWorK assignment(s). Once students click on a link, they receive a notification that they will be redirected to an application outside Blackboard.



The screenshot below shows an example of what a student sees after logging into WeBWorK.

The screenshot shows the WeBWorK interface for the "MA-LTI-PNT3 Orientation" assignment. At the top is a blue header with the MAA logo and "MATHEMATICAL ASSOCIATION OF AMERICA". To the right, it says "Logged in as [username]" with a "Log Out" button. Below the header is a breadcrumb trail: "webwork / test_lti / MA-LTI-PNT3_Orientation". The main heading is "MA-LTI-PNT3 Orientation", with a red arrow pointing to it from the text "Linked assignment". Below the heading is a "Homework Sets" button. The main content is a table with columns: Name, Attempts, Problems Remaining, Worth, and Status. The table lists 8 problems. Problem 4 is highlighted in yellow and has a status of 80%. To the right of the table is a "Set Info" box containing the assignment name, due date, and a link to functions and symbols. A red arrow points from the text "This shows what the status of each problem in the assignment" to the Status column of the table. At the bottom are buttons for "Email Instructor" and "Download PDF or TeX Hardcopy for Current Set".

Name	Attempts	Problems Remaining	Worth	Status
Problem 1	2	unlimited	1	100%
Problem 2	1	unlimited	1	100%
Problem 3	1	unlimited	1	100%
Problem 4	1	unlimited	1	80%
Problem 5	3	unlimited	1	100%
Problem 6	1	unlimited	1	100%
Problem 7	2	unlimited	1	100%
Problem 8	1	unlimited	1	100%

The screenshot above shows that login was successfully done via Blackboard, and the student can submit answers to the assignment before or on the due date.

In WeBWorK's configuration, the section and semester/year of a course are passed to WeBWorK. The information helps to facilitate instructors' management of their course accounts in the system.

Once in WeBWorK, students navigate and finish assignments the way they usually would, and WeBWorK behaves just as it would if there were no connection to Blackboard. The only difference is that when students submit a grade, they should get a message like the one below about the status of the submission.

MA-LTI-PNT3 HW 1: Problem 12

[Previous Problem](#)[Problem List](#)[Next Problem](#)

Results for this submission

Entered	Answer Preview	Result
3	3	correct
$y-3x = 0$	$y - 3x = 0$	correct

All of the answers above are correct.

(1 point) Find the slope and the equation for the line passing through the points: $(-1, -3)$ and $(0, 0)$.

Note: If the slope does not exist, enter: **Does not exist**

a) $m =$

3

b) The equation for the line:

$y=3x$

Note: You can earn partial credit on this problem.

[Preview My Answers](#)[Submit Answers](#)

I estimate that you answered ~~zero~~ questions incorrectly.

~~Your score was recorded. Your score was successfully sent to the LMS~~

~~You have attempted this problem 3 times.~~

You received a score of 100% for this attempt.

Your overall recorded score is 100%.

You have unlimited attempts remaining.

From the instructors' perspective, WeBWorK's class list shows the new student account created with a time stamp of the latest grade submission to the LMS, section, and semester/year of the course enrollment.

Classlist Editor

Show/Hide Site Description

Select an action to perform:

Filter Sort Edit Password Import Export Add Delete

Show Which Users?: users who match on selected field

What field should filtered users match on?: Login Name

Filter by what text?:

Take Action!

Showing 11 out of 11 users

Users List												
<input type="checkbox"/>	Login Name	Login Status	Assigned Sets	First Name	Last Name	Email Link	Student ID	Status	Section	Recitation	Comment	Permission Level
<input type="checkbox"/>	admin	Inactive	6/7		Administrator	Email	admin	Enrolled				admin
<input type="checkbox"/>	admin2	Active	6/7		Administrator	Email	admin2	Enrolled				admin
<input type="checkbox"/>	admin4	Inactive	6/7		Administrator	Email	admin4	Enrolled				admin
<input type="checkbox"/>	admin3	Inactive	6/7		Administrator	Email	feye	Enrolled				admin
<input type="checkbox"/>	dbejar	Inactive	6/7	Denis	Bejar	Email		Enrolled	60 Admin			professor
<input type="checkbox"/>	nkhomyak	Inactive	7/7	Khomyak	Nataliya	Email		Enrolled	LT test			professor
<input type="checkbox"/>	bsosnovski	Inactive	6/7	Bianca	Sosnovski	Email	bsosnovski	Enrolled				professor
<input type="checkbox"/>	10846814_previewuser	Inactive	6/7	Bianca	Sosnovski_PreviewUser			Enrolled			07/26/2019 at 01:18pm EDT	student
<input type="checkbox"/>	bsosnovski1	Inactive	6/7	test	test	Email	bsosnovski1	Enrolled	test			student
<input type="checkbox"/>	20081121023300940174	Inactive	6/7	Qbcc	Testperson			Enrolled	MA 336 PNT3[42324]	2018 Fall	08/01/2019 at 06:44pm EDT	student
<input type="checkbox"/>	20081121023300940175	Active	6/7	Qbcc	Testperson	Email		Enrolled	MA 336 PNT3[42324]	2018 Fall	08/01/2019 at 06:51pm EDT	student

Section and year/semester are provided in the student's profile

Time stamp updated every time student submit an answer in Ww

The following is the student's view in Blackboard's "My grades."

My Grades		
All Graded Upcoming Submitted		
Order by: Course Order		
ITEM	LAST ACTIVITY	GRADE
WeBWork Orientation DUE: JUL 26, 2019	JUL 25, 2019 3:02 PM GRADED	0.00 /8
WeBWork HW 1 DUE: JUL 27, 2019	JUL 26, 2019 10:30 AM GRADED	0.00 /100
WeBWork HW 2 DUE: JUL 28, 2019	UPCOMING	- /15

Active links

Not active link because student haven't clicked the link to the assignment

Grade submission

After submitting an assignment, the debugging message in WeBWork shows that the grade was passed successfully to the LMS.

MAIN MENU

Courses

Homework Sets

MA-LTI-PNT3 Orientation

Problem 8

User Settings

Grades

Problems

Problem 1 ✓

Problem 2 ✓

Problem 3 ✓

Problem 4 ...

Problem 5 ✓

Problem 6 ✓

Problem 7 ✓

Problem 8 ✓

webwork / test_lti / ma-lti-pnt3_orientation / 8

MA-LTI-PNT3 Orientation: Problem 8

Previous Problem

Problem List

Next Problem

Results for this submission

Entered	Answer Preview	Result
All of the answers above are correct.		
<div>(1 point)</div> <div>When You're Stuck...</div> <p>The goal of the WeBWork software is to help you learn mathematics by giving you immediate feedback on the correctness of your answer to a problem. It is not designed to be a tutorial or to replace humans in explaining the material to you. As with any learning tool, it is up to you to make efficient and effective use of the software. Here are some things you can try when you are stuck on a problem.</p> <ul style="list-style-type: none"> Reread the problem carefully to see if there are any instructions that you did not notice. Check carefully for directions on the Problem List page. You can get to this page by pressing the "Problem List" button at the top of any problem page. Look in the textbook for similar problems or relevant methods. 		

The student sees the following in WeBWork's grades.

Grades

Qbcc Testperson

Set	Percent	Score	Out Of	Problems																	
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
MA-LTI-PNT3 HW 1	0%	0.00	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MA-LTI-PNT3 HW 2	0%	0.00	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MA-LTI-PNT3 HW 3	0%	0.00	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MA-LTI-PNT3 HW 4	0%	0.00	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MA-LTI-PNT3 HW 5	0%	0.00	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MA-LTI-PNT3 Orientation	95%	7.60	8	100	100	100	60	100	100	100	100										
Homework Totals	9%	7.6	89																		

And faculty sees the following in Blackboard's Grade Center.

Create Column Create Calculated Column Manage Reports Filter Discover Content Work Offline

Sort Columns By: Layout Position Order: Ascending

Grade Information Bar Last Saved July 26, 2019 1:22 PM

	LAST NAME	FIRST NAME	USERNAME	LAST ACCESS	WEBWORK ORIENTATION	WEBWORK HW 1	WEBWORK HW 2
	Sosnovski_Preview1	Bianca		July 26, 2019	4.96	--	--
	Testperson	Qbcc		July 26, 2019	7.60	0.00	0.00

Selected Rows: 0

Move To Top Email

Link never clicked by user

Latest score passed to Bb

Link clicked by user but not answer submitted to the system

Icon Legend Edit Rows Displayed

If assignments are made visible in WeBWork but need links in Blackboard or their links were never used by the user, students would be able to see the sets but not access them directly via WeBWork.

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Logged in as 20081121023300940175. Log Out

< webwork / test_LTI

test_LTI

Homework Sets	
Name	Status
MA-LTI-PNT3 Orientation	Open, closes 07/26/2019 at 11:59am EDT.
MA-LTI-PNT3 HW 1	Open, closes 07/27/2019 at 11:59pm EDT.
MA-LTI-PNT3 HW 2	Open, closes 07/28/2019 at 11:59pm EDT.
MA-LTI-PNT3 HW 4	Open, closes 07/28/2019 at 11:59pm EDT. You must log into this set via your Learning Management System (e.g. Blackboard, Moodle, etc...).
MA-LTI-PNT3 HW 3	Open, closes 07/29/2019 at 11:59pm EDT. You must log into this set via your Learning Management System (e.g. Blackboard, Moodle, etc...).
MA-LTI-PNT3 HW 5	Open, closes 07/30/2019 at 11:59pm EDT. You must log into this set via your Learning Management System (e.g. Blackboard, Moodle, etc...).

Course Info

Welcome to WeBWork!

College: QCC - CUNY

Prof: B. Sosnovski

Assignments with links in Bb

Assignments created in Ww but without links in Bb

MAIN MENU
Courses
Homework Sets
MA-LTI-PNT3 HW 5
User Settings
Grades

Sets

MA-LTI-PNT3 HW 1
MA-LTI-PNT3 HW 2
MA-LTI-PNT3 Orientation

webwork / test_lfi / MA-LTI-PNT3_HW_5

MA-LTI-PNT3 HW 5 - Closes 07/30/2019 at 11:59pm EDT

Homework Sets

The selected problem set (MA-LTI-PNT3_HW_5) is not a valid set for [redacted].

You must use your Learning Management System (E.G. Blackboard, Moodle, Canvas, etc...) to access this set. Try logging in to the Learning Management System and visiting the set from there.

Page generated at 07/26/2019 at 12:43pm EDT
WeBWorK © 1996-2019 | theme: math4 | ww_version: WeBWorK-2.14 | pg_version PG-2.14 | The WeBWorK Project

Available assignments to user in Ww

Note:

In Blackboard, instructors do not have grades. In this case, they will see the message "Your score was not successfully sent to the LMS," which is OK. The following shows what they see in WeBWorK.

MA-LTI-PNT3 HW 1: Problem 14

Previous Problem Problem List Next Problem

This set is **visible to students**.

Results for this submission

Entered	Answer Preview	Result
$2x + y = 2$	$2x + y = 2$	correct

The answer above is correct.

(1 point) Library/CollegeOfIdaho/setAlgebra_02_04_PointSlopeFormofLine/24IntAlg_26_LinearFunction.pg
Find the equation for the line passing through the point $(2, -2)$ and perpendicular to the line whose equation is $-2x + 4y + 8 = 0$.

Answer:

Solution:

Edit2 Edit3

Show: ☐ CorrectAnswers ☐ AnswerGroupInfo ☐ Show Auxiliary Resources ☐ AnswerHashInfo ☐ PGInfo

Preview My Answers Check Answers Submit Answers

I estimate that you answered **zero** questions incorrectly.

Your score was recorded. Your score was not successfully sent to the LMS.

You have attempted this problem 1 time.

You received a score of 100% for this attempt.

Your overall recorded score is 100%.

You have unlimited attempts remaining.

Instructors can switch to the "Student Preview" mode in Blackboard and click on a specific assignment link. Once the Instructors successfully log in as a student, see the assignment, and try answering some questions, they will see the corresponding scores appear in their student preview account in Blackboard's Grade Center.

Using the student preview mode in Blackboard is a way to ensure that grades are being passed back to the system; otherwise, if grades are not being passed back, instructors must troubleshoot.

In either case, Blackboard logs you into the same account in WeBWorK.

Student Preview mode is ON

2018 Fall Term (1) Statistics MA 336 PNT3(42324) (Queensborough CC) My Grades

My Grades

ITEM	LAST ACTIVITY	GRADE
WebWork Orientation DUE: JUL 26, 2019	JUL 26, 2019 1:22 PM GRADED	4.96 /8
WebWork HW 1 DUE: JUL 27, 2019	UPCOMING	- /100
WebWork HW 2 DUE: JUL 28, 2019	UPCOMING	- /15

Other WeBWork's features:

One of the essential features of WeBWork is the button, [Email instructor](#) which students use to communicate with instructors about a specific problem in the assignment posted.

If students click on the button, they will be taken to a page where they can type a question that will be sent to their instructor. Then the instructor will receive a link that will take them directly to the problem student is working on.

< webwork / test_lti / Feedback

E-mail Instructor

From: mail@qcc.cuny.edu

Use this form to report to your professor a problem with the WeBWork system or an error in a problem you are attempting. A

E-mail:*

Student's email passed from Bb to Ww

Send E-mail

Cancel E-mail

This WeBWork feature helps faculty to provide feedback to students.

Summary

With the integration, the Department's WeBWorK server allows direct login via Blackboard, and it includes the:

- Automatic creation of WeBWorK student accounts from Blackboard;
- Single login via Blackboard;
- Automatic grade passback from WeBWorK to Blackboard;
- Assignments are assigned to users once visible.

What remains the same:

- WeBWorK courses are created at the request of course instructors by the department WeBWorK administrators;
- Instructor accounts must be manually created on WeBWorK;
- Assignments are created, opened, and closed on WeBWorK.