

WeBWorK and the Math Support Center at HKUST

Workshop@UST Jun 10-11



WeBWorK and the Math Support Center at HKUST

About This Talk

To provide some brief background information for the Workshop participants on:

- The WeBWorK system
- A brief history of WeBWorK at HKUST
- The development and current status of the Math Support Center at HKUST
- A few things that triggered these actions for change

and perhaps also a brief tour of the workshop program between the lines.

WeBWork and the Math Support Center at HKUST

What is WeBWork?

Suffice it to say briefly here that WeBWork is an open-source and freely available online homework system for math and science courses, originally developed by Professors Michael Gage and Arnold Pizer at the University of Rochester.

Obviously you will find out more about the system from the next talk *“The WeBWork Online Homework System And Its Academic Community”* by Prof. Gage, one of the two keynote speakers of this workshop.

WeBWork is supported by the Mathematical Association of America (MAA) and the National Science Foundation (NSF, USA).

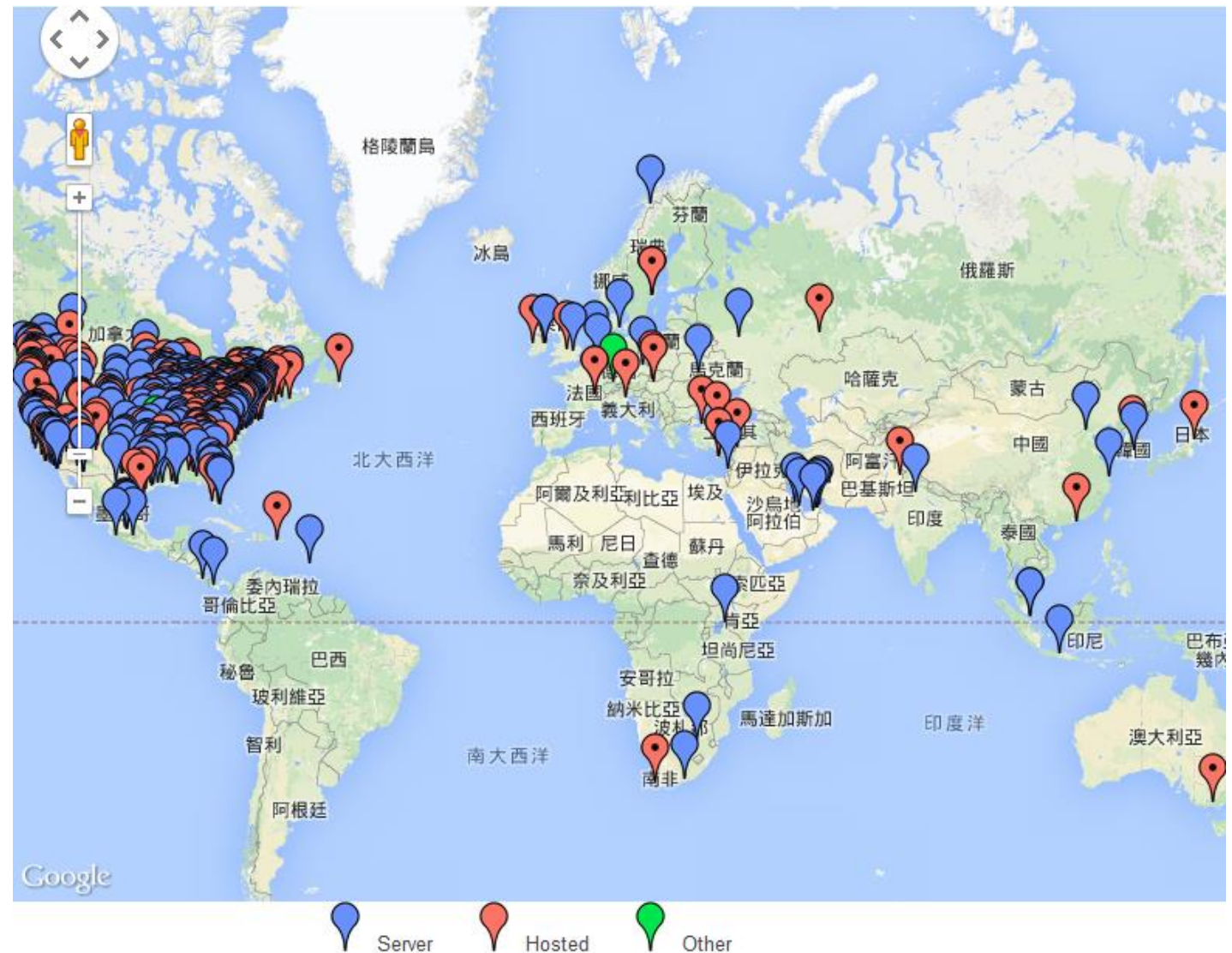
A lot about WeBWork can also be found at:

[WeBWork at MAA](#)

WeBWork and the Math Support Center at HKUST

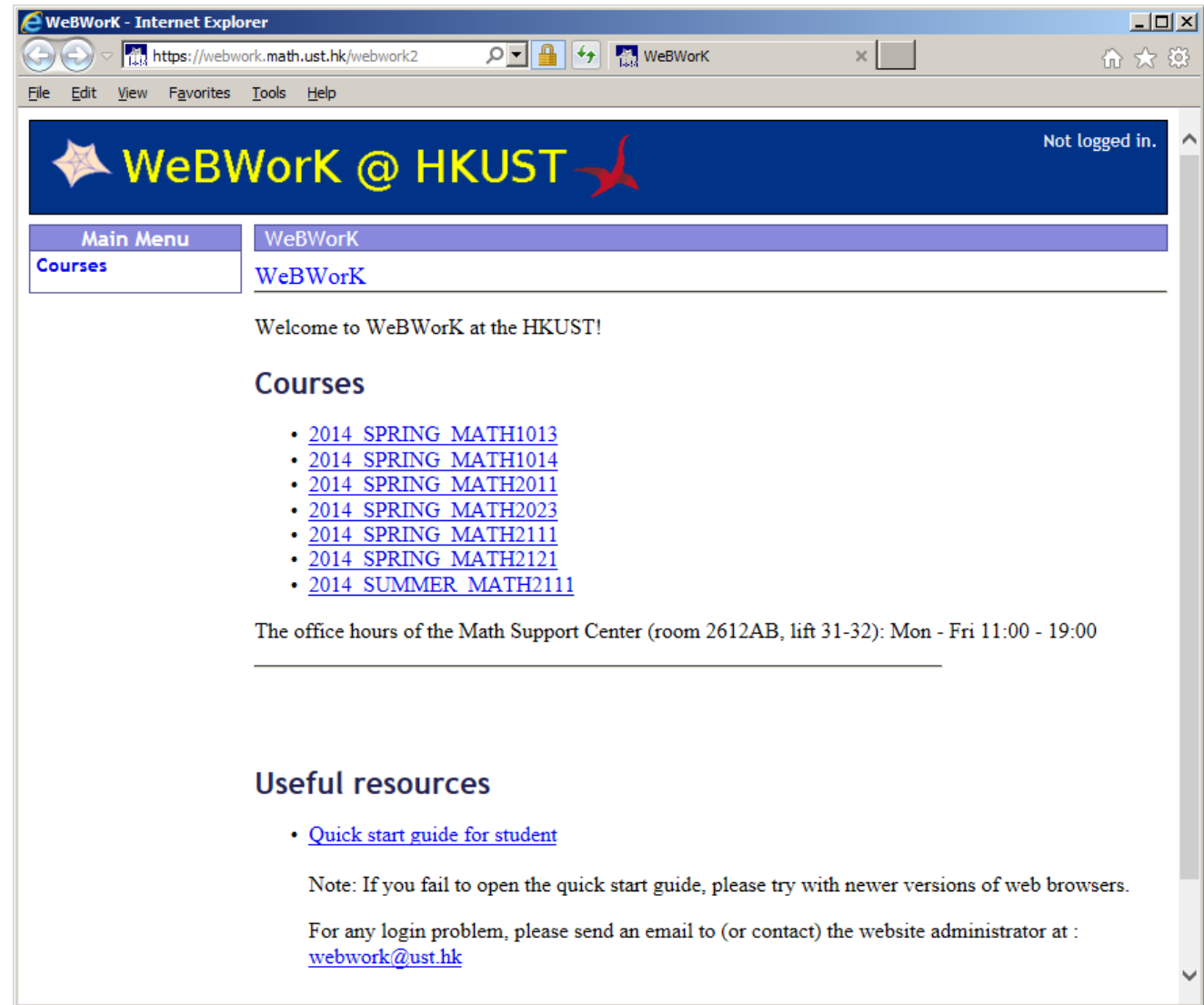
Who are using WeBWork?

More than 700 educational institutions world wide!



WeBWork and the Math Support Center at HKUST

WeBWork@UST for students



The screenshot shows the WeBWork@HKUST website in an Internet Explorer browser window. The address bar shows the URL <https://webwork.math.ust.hk/webwork2>. The page has a blue header with the text "WeBWork @ HKUST" and a "Not logged in." status. A left sidebar contains a "Main Menu" with a "Courses" link. The main content area has a "Welcome to WeBWork at the HKUST!" message, followed by a "Courses" section with a bulleted list of course links: [2014 SPRING MATH1013](#), [2014 SPRING MATH1014](#), [2014 SPRING MATH2011](#), [2014 SPRING MATH2023](#), [2014 SPRING MATH2111](#), [2014 SPRING MATH2121](#), and [2014 SUMMER MATH2111](#). Below this is the office hours information: "The office hours of the Math Support Center (room 2612AB, lift 31-32): Mon - Fri 11:00 - 19:00". A "Useful resources" section includes a link to a "Quick start guide for student" and a note about using newer web browsers. At the bottom, it provides contact information for the website administrator: "For any login problem, please send an email to (or contact) the website administrator at : webwork@ust.hk".

WebWork - Internet Explorer

<https://webwork.math.ust.hk/webwork2>

File Edit View Favorites Tools Help

Not logged in.

WeBWork @ HKUST

Main Menu

Courses

WeBWork

WeBWork

Welcome to WeBWork at the HKUST!

Courses

- [2014 SPRING MATH1013](#)
- [2014 SPRING MATH1014](#)
- [2014 SPRING MATH2011](#)
- [2014 SPRING MATH2023](#)
- [2014 SPRING MATH2111](#)
- [2014 SPRING MATH2121](#)
- [2014 SUMMER MATH2111](#)

The office hours of the Math Support Center (room 2612AB, lift 31-32): Mon - Fri 11:00 - 19:00

Useful resources

- [Quick start guide for student](#)

Note: If you fail to open the quick start guide, please try with newer versions of web browsers.

For any login problem, please send an email to (or contact) the website administrator at : webwork@ust.hk

WeBWork and the Math Support Center at HKUST

WeBWork@UST for students

WebWork : 2014_SPRING_MATH1014 - Internet Explorer

https://webwork.math.ust.hk/webwork2/2014_SP

File Edit View Favorites Tools Help

Not logged in.

WeBWork @ HKUST

Main Menu

Courses

webwork → 2014_SPRING_MATH1014

2014_SPRING_MATH1014

HKUST Math Support Center

From Week 2 to Week 14 of the Spring semester, webwork math course students may visit the [Math Support Center](#) for assistance on their mathematics study or webwork homework provided by course instructors, IAs, TAs and student helpers.

Opening Time and Location of the Math Support Center (MSC)

- Room 2612AB, Lift 31-32: Mon to Fri (11:00-19:00)

Visit the webpage of the MSC at [Math Support Center](#) for detailed schedule.

Please enter your HKUST ITSC Network Account information **2014_SPRING_MATH1014** below:

Username:

Password:

Page generated at 06/06/2014 at 12:11pm HKT / Dept of Math
WeBWork © 1996-2011 [The WeBWork Project](#)

WeBWork and the Math Support Center at HKUST

WeBWork@UST for students

- Homework delivered on line
- Homework graded automatically
- Multiple trials allowed
- Answers available after due day

WebWork : 2014_SPRING_MATH1014 - Internet Explorer

https://webwork.math.ust.hk/webwork2/2014_SP

WebWork : 2014_SPRING_M...

File Edit View Favorites Tools Help

WeBWork @ HKUST

Logged in as wwstudent1.
[Log Out](#)

Main Menu

- [Courses](#)
- [Homework Sets](#)
- [Grades](#)

webwork → 2014_SPRING_MATH1014

2014_SPRING_MATH1014

Homework Sets	
<u>Name</u>	<u>Status</u>
<input type="radio"/> Homework-1	closed, answers available
<input type="radio"/> Homework-2	closed, answers available
<input type="radio"/> Homework-3	closed, answers available
<input type="radio"/> Homework-4	closed, answers available
<input type="radio"/> Homework-5	closed, answers available
<input type="radio"/> Homework-6	closed, answers available
<input type="radio"/> Homework-7	closed, answers available
<input type="radio"/> Homework-8	closed, answers available
<input type="radio"/> Homework-9	closed, answers available
<input type="radio"/> Homework-10	closed, answers available
<input type="radio"/> Homework-11	closed, answers available

Course Info

Math1014 Calculus II, Spring 2014

This is the sequel to Math1013 in one-variable calculus. Key topics include: Applications of definite integrals, integration techniques, improper integrals, differential equations, infinite sequences and series, power series and Taylor series, vectors.

Assessment

Online Homework (WeBWork): 12%
Midterm Exam: 33% **Mar 30 (Sunday), 10:15-11:45**
Final Exam: 55%

Textbook

W. L. Briggs, L. Cochran and B. Gillett. *Calculus for Scientists and Engineers - Early Transcendentals*. Pearson, 2013.

[Math Support Center Spring 2014 Schedule](#)

Instructors and Lectures

- [Dr. LAM Tsz Kin](#) (Office: Rm 3435)
 - L1: MW 12:00-13:20 LTF
- [Dr. Zheng, Wendong](#) (Office: Rm 3428)
 - L2: TuTh 13:30-14:50 Rm 4620
- [Dr. Chow, Kim Chiu](#) (Office: Rm 3492)

WeBWork and the Math Support Center at HKUST

WeBWork@UST for students

- Homework delivered on line
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The screenshot shows the WeBWork@HKUST interface in an Internet Explorer browser. The page title is "WeBWork: 2014_SPRING_MATH1014: Homework-1". The URL is "https://webwork.math.ust.hk/webwork2/2014_SPRING_MATH1014/Homework-1/". The page is logged in as "wwstudent1".

The main menu on the left includes "Courses", "Homework Sets", "Homework-1", and "Grades". Under "Homework Sets", there is a list of sets: "Homework-1", "Homework-2", "Homework-3", "Homework-4", "Homework-5", "Homework-6", "Homework-7", "Homework-8", "Homework-9", "Homework-10", and "Homework-11".

The "Display Options" section shows "View equations as:" with radio buttons for "images" (selected), "jsMath", and "MathJax". There is an "Apply Options" button.

The main content area shows the "Homework-1" set. It includes a "Download PDF or TeX Hardcopy for Current Set" link and a "Problems" table. The table has columns: "Name", "Attempts", "Remaining", "Worth", and "Status".

Name	Attempts	Remaining	Worth	Status
Problem 1	0	unlimited	5	0%
Problem 2	0	unlimited	5	0%
Problem 3	0	unlimited	6	0%
Problem 4	0	unlimited	6	0%
Problem 5	0	unlimited	6	0%
Problem 6	0	unlimited	6	0%
Problem 7	0	unlimited	6	0%
Problem 8	0	unlimited	8	0%
Problem 9	0	unlimited	6	0%
Problem 10	0	unlimited	7	0%
Problem 11	0	unlimited	7	0%
Problem 12	0	unlimited	8	0%
Problem 13	0	unlimited	6	0%
Problem 14	0	unlimited	6	0%
Problem 15	0	unlimited	6	0%
Problem 16	0	unlimited	6	0%

The "Set Info" section on the right shows "Math1014 Calculus II" and "Homework 1: Applications of Integration". The deadline is "02/25/2014 at 11:50pm HKT".

To solve the problems in this homework set, you need to recall how to compute definite integrals by the Fundamental Theorem of Calculus, and need to set up integrals in various contexts:

1. net change of certain quantity as an integral; e.g., displacement, velocity, cost, ...;
2. area between curves;
3. volume of solid regions by slicing or shells.

Give 4 or 5 significant digits for numerical answers. For most problems when entering numerical answers, you can if you wish enter elementary expressions such as 3^2 or 3^{**2} instead of 9, $\sin(3*\pi/2)$ instead of -1, $e^{(\ln(3))}$ instead of 3, $(1+\tan(3))*(4-\sin(5))^6-15/8$ instead of 12748.8657, etc. The system can compute the numerical value for you.

Page generated at 06/06/2014 at 12:26pm HKT / Dept of Math
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WeBWork and the Math Support Center at HKUST

WeBWork@UST for students

- Homework delivered on line
- Homework graded automatically
- Multiple trials allowed

WebWork: 2014_SPRING_MATH1014: Homework-1: 10 - Internet Explorer

https://webwork.math.ust.hk/webwork2/2014_SPRING_MATH1014/homework-1/10/?effects

File Edit View Favorites Tools Help

WeBWork @ HKUST Logged in as wwstudent1. [Log Out](#)

webwork → 2014_spring_math1014 → homework-1 → 10

Homework-1: Problem 10 [Prev](#) [Up](#) [Next](#)

(7 pts)

Main Menu

- Courses
- Homework Sets
 - Homework-1
 - Problem 10
- Grades

Problems

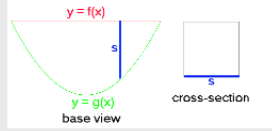
- Problem 1
- Problem 2
- Problem 3
- Problem 4
- Problem 5
- Problem 6
- Problem 7
- Problem 8
- Problem 9
- Problem 10
- Problem 11
- Problem 12
- Problem 13
- Problem 14
- Problem 15
- Problem 16

Display Options

View equations as:
☒ Images
☐ jsMath
☐ MathJax

Show saved answers?
☐ Yes ☒ No

[Apply Options](#)



The base of a certain solid is the area bounded above by the graph of $y = f(x) = 36$ and below by the graph of $y = g(x) = 16x^2$. Cross-sections perpendicular to the x -axis are squares. (See picture above, click for a better view.)

Use the formula

$$V = \int_a^b A(x) dx$$

to find the volume of the solid.

Note: You can get full credit for this problem by just entering the final answer (to the last question) correctly. The initial questions are meant as hints towards the final answer and also allow you the opportunity to get partial credit.

The lower limit of integration is $a =$

The upper limit of integration is $b =$

The side s of the square cross-section is the following function of x :

$A(x) =$

Thus the volume of the solid is $V =$

Note: You can earn full credit by answering just the last part.

☐ Show correct answers

[Preview Answers](#) [Check Answers](#)

You have attempted this problem 0 times.
This homework set is closed.

Page generated at 06/06/2014 at 12:28pm HKT / Dept of Math
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WeBWork@UST for students

- Homework delivered on line
- Homework graded automatically
- Multiple trials allowed
- Answers available after due day

WebWork: 2014_SPRING_MATH1014: Homework-1: 10 - Internet Explorer

https://webwork.math.ust.hk/webwork2/2014_SPRING_MATH1014/homework-1/10/

File Edit View Favorites Tools Help

WeBWork @ HKUST Logged in as wwstudent1. [Log Out](#)

webwork → 2014_spring_math1014 → homework-1 → 10

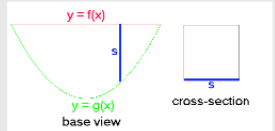
Homework-1: Problem 10 [Prev](#) [Up](#) [Next](#)

ANSWERS ONLY CHECKED -- ANSWERS NOT RECORDED

Entered	Answer Preview	Result
-1.5	$-\frac{3}{2}$	correct
3	3	incorrect
$36-16*(x^2)$	$36 - 16x^2$	correct
$[36-16*(x^2)]^{99}$	$(36 - 16x^2)^{99}$	incorrect
100	100	incorrect

At least one of the answers above is NOT correct.

(7 pts)



The base of a certain solid is the area bounded above by the graph of $y = f(x) = 36$ and below by the graph of $y = g(x) = 16x^2$. Cross-sections perpendicular to the x -axis are squares. (See picture above, click for a better view.)

Use the formula

$$V = \int_a^b A(x) dx$$

to find the volume of the solid.

Note: You can get full credit for this problem by just entering the final answer (to the last question) correctly. The initial questions are meant as hints towards the final answer and also allow you the opportunity to get partial credit.

The lower limit of integration is $a = -3/2$

The upper limit of integration is $b = 3$

The side s of the square cross-section is the following function of x : $(36-16x^2)$

$A(x) = (36-16x^2)^{99}$

Thus the volume of the solid is $V = 100$

WeBWork and the Math Support Center at HKUST

WeBWork@UST for students



- Homework delivered on line
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- Multiple trials allowed
- Answers available after due day

WebWork : 2014_SPRING_MATH1014 : Grades - Internet Explorer

https://webwork.math.ust.hk/webwork2/2014_SP

WebWork : 2014_SPRING_M...

File Edit View Favorites Tools Help

 **WeBWork @ HKUST** 

Logged in as wwstudent1.
[Log Out](#)

Main Menu

- Courses
- Homework Sets
- Grades

webwork → 2014_spring_math1014 → Grades

Grades

wwstudent1

Set	Score	Out Of	Problems															
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Homework-1	0.00	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Homework-10	0.00	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Homework-11	0.00	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Homework-2	0.00	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Homework-3	0.00	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Homework-4	0.00	51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Homework-5	0.00	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Homework-6	0.00	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Homework-7	0.00	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Homework-8	0.00	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Homework-9	0.00	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

There is no additional grade information. The spreadsheet file /opt/webwork/courses/2014_SPRING_MATH1014/templates/email/report_grades.msg cannot be found.

Page generated at 06/06/2014 at 12:42pm HKT / Dept of Math
WeBWork © 1996-2011 [The WeBWork Project](#)

WeBWork and the Math Support Center at HKUST

WeBWork for instructors

A online platform to

- create and assign online homework
- select homework problems from a large problem bank
- monitor students' progress
- respond to students' email enquires
- create quizzes

The screenshot shows the WeBWork @ HKUST web application in an Internet Explorer browser. The page is titled "WeBWork : 2014_SPRING_MATH1014 - Internet Explorer" and the address bar shows "https://webwork.math.ust.hk/webwork2/2014_SP". The user is logged in as "tklam" and can click "Log Out".

The main menu on the left includes: Courses, Homework Sets, Grades, Instructor Tools (Classlist Editor, Hmwk Sets Editor, Library Browser, Library Browser 2, Statistics, Student Progress, Scoring Tools, Email, File Manager, Course Configuration, Help), and Report bugs.

The main content area is titled "webwork → 2014_SPRING_MATH1014" and "2014_SPRING_MATH1014". It features a table of homework sets:

Name	Status
<input type="checkbox"/> Old-hwk-6-backup	will open on 01/20/2015 at 10:03am HKT
<input type="checkbox"/> Old-hwk-5-backup	will open on 01/20/2015 at 10:04am HKT
<input type="checkbox"/> Homework-1	closed, answers available
<input type="checkbox"/> Homework-2	closed, answers available
<input type="checkbox"/> Homework-3	closed, answers available
<input type="checkbox"/> Homework-4	closed, answers available
<input type="checkbox"/> Homework-5	closed, answers available
<input type="checkbox"/> Homework-6	closed, answers available
<input type="checkbox"/> Homework-7	closed, answers available
<input type="checkbox"/> Homework-8	closed, answers available
<input type="checkbox"/> Homework-9	closed, answers available
<input type="checkbox"/> Homework-10	closed, answers available
<input type="checkbox"/> Homework-11	closed, answers available

Below the table are buttons for "Clear" and "Download PDF or TeX Hardcopy for Selected Sets".

On the right, the "Course Info [edit]" section for "Math1014 Calculus II, Spring 2014" provides details: "This is the sequel to Math1013 in one-variable calculus. Key topics include: Applications of definite integrals, integration techniques, improper integrals, differential equations, infinite sequences and series, power series and Taylor series, vectors." It also lists the "Assessment" (Online Homework: 12%, Midterm Exam: 33% on Mar 30, Final Exam: 55%) and the "Textbook" (W. L. Briggs, L. Cochran and B. Gillett, *Calculus for Scientists and Engineers - Early Transcendentals*, Pearson, 2013).

At the bottom right, the "Instructors and Lectures" section lists: Dr. LAM, Tsz Kin (Office: Rm 3435, L1: MW 12:00-13:20 LTF), Dr. Zheng, Wendong (Office: Rm 3428, L2: TuTh 13:30-14:50 Rm 4620), and Dr. Chow, Kim Chiu (Office: Rm 3492).

WeBWork and the Math Support Center at HKUST

WeBWork for instructors

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- respond to students' email enquires

WebWork : 2014_SPRING_MATH1014 : Instructor Tools : Hmwk Sets Editor - Internet Explorer

https://webwork.math.ust.hk/webwork2/2014_SPRING_MATH1014/instructor/sets/7effectiv... WebWork : 2014_SPRING_M...

File Edit View Favorites Tools Help

WeBWork @ HKUST Logged in as tklam. Log Out

webwork → 2014_spring_math1014 → instructor tools → Hmwk Sets Editor

Hmwk Sets Editor

Please select action to be performed.

Select an action to perform:

- ☐ Show sets with matching set IDs: (separate multiple IDs with commas)
- ☐ Primary sort: Due Date Secondary sort: Open Date
- ☐ Edit selected sets
- ☐ Make selected sets visible for students.
- ☐ Import a single set from the following file(s) with set name(s): assigning this set to only tklam.
- ☐ Export visible sets
- ☐ Score no sets.
- ☐ Create a new set named: as a new empty set.
- ☐ Delete no sets. *Deletion destroys all set-related data and is not undoable!*

Select all sets Unselect all sets

Take Action!

Showing 13 out of 13 sets.

Select	Edit Set Data	Edit Problems	Edit Assigned Users	Visible	Reduced Credit Enabled	Open Date	Due Date	Answer Date
<input type="checkbox"/>	Homework-1	16	1213/1213	Yes	No	02/01/2014 at 09:00am HKT	02/25/2014 at 11:50pm HKT	02/26/2014 at 05:00pm HKT
<input type="checkbox"/>	Homework-2	10	1185/1213	Yes	No	02/18/2014 at 02:00pm HKT	03/05/2014 at 11:50pm HKT	03/06/2014 at 05:00pm HKT
<input type="checkbox"/>	Homework-3	10	1185/1213	Yes	No	02/18/2014 at 05:00pm HKT	03/11/2014 at 11:50pm HKT	03/12/2014 at 05:00pm HKT
<input type="checkbox"/>	Homework-4	10	1185/1213	Yes	No	03/01/2014 at 09:00am HKT	03/24/2014 at 11:50pm HKT	03/25/2014 at 10:30am HKT
<input type="checkbox"/>	Homework-5	10	1185/1213	Yes	No	03/01/2014 at 09:00am HKT	03/27/2014 at 11:50pm HKT	03/28/2014 at 10:30am HKT
<input type="checkbox"/>	Homework-6	10	1184/1213	Yes	No	03/24/2014 at 09:00am HKT	04/10/2014 at 11:50pm HKT	04/11/2014 at 10:30am HKT
<input type="checkbox"/>	Homework-7	8	1184/1213	Yes	No	03/24/2014 at 09:00am HKT	04/18/2014 at 11:50pm HKT	04/19/2014 at 10:30am HKT
<input type="checkbox"/>	Homework-8	10	1183/1213	Yes	No	04/07/2014 at 10:00am HKT	04/30/2014 at 11:50pm HKT	05/01/2014 at 10:00am HKT
<input type="checkbox"/>	Homework-9	10	1183/1213	Yes	No	04/07/2014 at 10:00am HKT	05/10/2014 at 11:50pm HKT	05/13/2014 at 11:10am HKT
<input type="checkbox"/>	Homework-11	10	1182/1213	Yes	No	04/22/2014 at 10:00am HKT	05/15/2014 at 11:30pm HKT	05/16/2014 at 01:00pm HKT

WeBWork and the Math Support Center at HKUST

WeBWork for instructors

A online platform to

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- respond to students' email enquires

WebWork : 2014_SPRING_MATH1014 : Instructor Tools : Library Browser - Internet Explorer

https://webwork.math.ust.hk/webwork2/2014_SPRING_MATH1014/instructor/setmaker/

File Edit View Favorites Tools Help

WeBWork @ HKUST Logged in as tklam. Log Out

webwork → 2014_spring_math1014 → instructor tools → Library Browser

Library Browser

Add problems to **Target Set**:

Create a New Set in This Course:

Browse

or Problems from

Subject:

Chapter:

Section:

Display Mode: Max. Shown: ☐ Hints ☐ Solutions

There are 243 matching WeBWork problem files

File name: Library/Michigan/Chap3Sec5/Q39.pg [Edit it](#) [Try it](#)

☐ Don't show this problem on the next update

☐ Add this problem to the target set on the next update

(0 pts) Find the derivative of $G(x) = \frac{\sin^7 x + 1}{\cos^7 x + 1}$

$G'(x) =$

MathObject version

File name: Library/Michigan/Chap3Sec5/Q09.pg [Edit it](#) [Try it](#)

☐ Don't show this problem on the next update

☐ Add this problem to the target set on the next update

(0 pts) Find the derivative of $f(x) = x^7 \cos x$

$f'(x) =$

MathObject version

WeBWork and the Math Support Center at HKUST

WeBWork for instructors

- create and assign online homework
- select homework problems from a large problem bank
- monitor students' progress
- respond to students' email enquires

The screenshot shows the WeBWork @ HKUST interface in an Internet Explorer browser. The address bar shows the URL: https://webwork.math.ust.hk/webwork2/2014_SP. The page title is "WeBWork : 2014_SPRING_MATH1014 : Instructor Tools : Statistics".

The interface includes a "Main Menu" on the left with the following links:

- Courses
- Homework Sets
- Grades
- Instructor Tools
 - Classlist Editor
 - Hmwk Sets Editor
 - Library Browser
 - Library Browser 2
- Statistics
 - Student Progress
 - Scoring Tools
 - Email
 - File Manager
 - Course Configuration
 - Help ?
- Report bugs

The "Statistics" section is currently selected, showing a list of homework sets:

- Homework-1
- Homework-10
- Homework-11
- Homework-2
- Homework-3
- Homework-4
- Homework-5
- Homework-6
- Homework-7
- Homework-8
- Homework-9
- Old-hwk-5-backup
- Old-hwk-6-backup

The main content area displays the breadcrumb trail: [webwork](#) → [2014_spring_math1014](#) → [instructor tools](#) → [Statistics](#). Below this, the page title is "Statistics for 2014_SPRING_MATH1014".

The main content area is divided into two columns:

- View statistics by set**
 - [Homework-1](#)
 - [Homework-10](#)
 - [Homework-11](#)
 - [Homework-2](#)
 - [Homework-3](#)
 - [Homework-4](#)
 - [Homework-5](#)
 - [Homework-6](#)
 - [Homework-7](#)
 - [Homework-8](#)
 - [Homework-9](#)
 - [Old-hwk-5-backup](#)
 - [Old-hwk-6-backup](#)
- View statistics by student**
 - [abe](#)
 - [adn](#)
 - [aja](#)
 - [ajsl](#)
 - [akh](#)
 - [ame](#)
 - [atar](#)
 - [awi](#)
 - [awj](#)
 - [awr](#)
 - [axie](#)
 - [bch](#)
 - [bcl](#)
 - [bde](#)
 - [bga](#)
 - [bgc](#)
 - [bha](#)
 - [blu](#)
 - [blw](#)
 - [ccc](#)
 - [ccc](#)
 - [ccc](#)
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WeBWork and the Math Support Center at HKUST

WeBWork for instructors

- create and assign online homework
- select homework problems from a large problem bank
- monitor students' progress
- respond to students' email enquires

WebWork: 2014_SPRING_MATH1014 : Instructor Tools : Statistics : Statistics - Internet Explorer

https://webwork.math.ust.hk/webwork2/2014_SPRING_MATH1014/instructor/stats/set/Homework-3

File Edit View Favorites Tools Help

WeBWork @ HKUST Logged in as tkiam. Log Out

webwork → 2014_spring_math1014 → instructor tools → statistics → Statistics

Statistics for 2014_SPRING_MATH1014 set Homework-3. Due 03/11/2014 at 11:50pm HKT

The percentage of active students with correct answers for each problem

Problem #	1	2	3	4	5	6	7	8	9	10
% correct	100	99	100	100	98	100	99	100	97	99
avg attempts	2.3	3.1	2.0	2.6	5.3	4.8	1.6	1.8	5.9	2.1

The percentage of students receiving at least these scores.
The median score is in the 50% column.

% students	90	80	70	60	50	40	30	20	10	top score
Score	100	-	-	-	-	-	-	-	-	100
Success Index	17	23	26	29	33	38	43	48	59	100

Percentile cutoffs for number of attempts.
The 50% column shows the median number of attempts

% students	95	75	50	25	5	1
Prob 1	9	6	3	2	1	-
Prob 2	16	8	4	2	1	-
Prob 3	9	5	2	1	-	-
Prob 4	12	7	3	2	1	-
Prob 5	21	14	7	4	2	1
Prob 6	21	14	6	3	2	1
Prob 7	7	4	2	1	-	-
Prob 8	6	4	2	1	-	-
Prob 9	32	16	7	4	2	1
Prob 10	9	5	2	1	-	-

Page generated at 06/06/2014 at 01:13pm HKT / Dept of Math
WeBWork © 1996-2011 The WeBWork Project

WeBWorK and the Math Support Center at HKUST

Hands on WeBWorK

Three short “*Hands-On Usage of WeBWorK*” sessions at the Math Support Center (MSC) for interested workshop participants have been scheduled as follows:

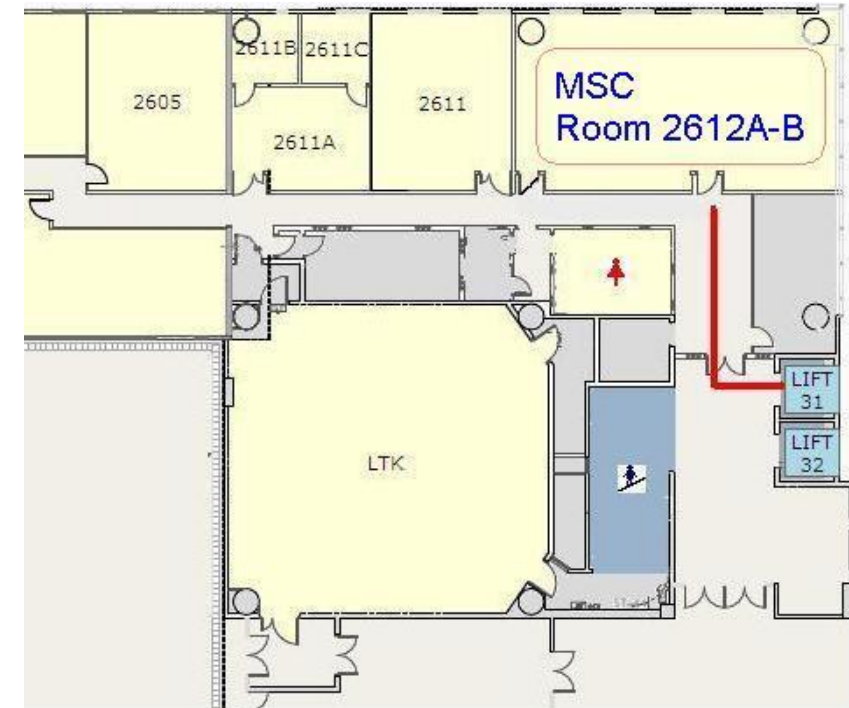
Room 2612AB

Tue

- 12:00-12:45,
- 16:15-17:45

Wed

- 16:00-17:30



Participants can login the computers there with the guest account (*information printed on the back side of your name tag*), or use WiFi through sMobileNet.

<http://pathadvisor.ust.hk/>

WeBWorK and the Math Support Center at HKUST

When did WEBWorK start here at HKUST?

In a critical period 2011-2012!

Latest Education Reform in Hong Kong

1997-2000	A comprehensive review of the education system in Hong Kong was carried out.	
2000	<i>Learning for Life, Learning Through Life: Reform Proposals for the Education System in Hong Kong</i> – Education Commission.	
Structural Change	Old Academic Structure	New Academic Structure
Secondary Education (Years)	3 (Form 1 – Form 3) 2 (Form 4 – Form 5) 2 (Form 6 – Form 7)	3 (S1 – S3) 3 (S4 – S6)
Higher Education	3 (University)	4 (University)
Fall 2012	1 st cohort of graduates of the 334-system entering universities, at the same time with the last cohort of graduates of the old 3223-system.	
<i>Some daunting consequences for universities: had to double the admissions in academic year 2012-13 and reform the university curriculum structure accordingly. A lot of other administrative work of course.</i>		

WeBWork and the Math Support Center at HKUST

What the reform meant to the Math Dept at HKUST

- Developing a new curriculum, in coordination with the other departments and schools
- Allocating sufficient resources to deal with larger enrolments, especially for the increase in teaching load

Calculus Courses in the Old Days

One variable calculus courses were here then mainly for:

- Business students without A-Level math background – about 4 lecture sections with around 80 to 100 students per section.
- Other students without A-Level math background – ranging from 3 to 5 lecture sections with around 80 to 100 students per section.

(However, the number of students without A-Level math background increased over the years.)

Format of these courses

- Lectures + Tutorials

Calculus Courses in the New Curriculum

Most students would have to take a sequence of basic calculus courses, with enrolment number around 1200 to 1700.

WeBWork and the Math Support Center at HKUST

A 2011-2012 Pilot Project

WeBWork solution to release some grading workload

To prepare for the teaching of the common core level math courses in the new curriculum, in 2011-12, the Math Dept implemented WeBWork through a pilot project initiated by Prof. A. Moy, Head of the Math Dept.

The project was supported by a *Teaching Development Grant* from the **Center for Enhanced Learning and Teaching, HKUST (CELT)**.

Other project team members:

Prof. S. Y. Cheng

Prof. C. H. Fung

Mr. Simon Hu

Mr. Cook Wong



Project Title	WeBWork@HKUST – A Pilot implementation of an Online Interactive Homework System for Common Core Level Mathematics Courses
Project Leaders	Department of Mathematics - Prof. A. Moy and Dr. T. K. Lam

Project Objectives

The project aims at initiating the implementation of WeBWork for common core level mathematics courses at HKUST. WeBWork is an open source interactive homework system currently managed by the Mathematical Association of America. It has been adapted by over 300 colleges and universities worldwide in their teaching practices since its first appearance in the late nineties.

The primary goal of the project is to install and test the system on a few pilot courses, which will pave the way for further implementation of the system during the 2012-13 academic year. In general, the project is a part of the efforts of the Math Department to enhance the teaching and learning of mathematics at HKUST.

In and Beyond the Classroom

WeBWork delivers and grades individualized homework which helps to reduce grading resources, as well as direct copying of the work of others. Through providing instant feedback to the answers submitted, the system may help students to better assess their own learning progress. Students can also easily contact their instructors through the system's email function for advice on specific homework problems.

In the first pilot course, students generally found the system easy to access through various devices: laptops, home PCs, mobile phones, etc, making it easy to refer to specific problems in lectures or tutorials.

Statistical data provided by WeBWork can inform the instructors on the overall progress of the students, as well as their particular learning difficulties. Future exploration of the other functions of WeBWork may include the designing of tutorial or gateway quizzes or other learning activities.

Learning Impact

The results of two surveys carried out by CELT show that the students generally had a positive experience with WeBWork. The instructors have also been able to observe students having thoughtful discussions on the homework problems, which is encouraging. Nevertheless, it remains a challenge to enhance the communication between the students and the instructors, or the learning and the teaching, via WebWork.



WeBWorK and the Math Support Center at HKUST

Piloting WeBWorK@UST, and thereafter

WeBWorK@UST was first used in Math1003 in Fall 2011, an algebra and calculus course for about 200 business students.

In Spring 2012, we tried it on Math2111, a linear algebra course with about 300 students, and also Math2011, a multivariable calculus course with about 400 students.

With the help of colleagues teaching these courses, the implementation went through rather smoothly. Students responses sounded positive enough to us.

And then, WeBWorK@UST survived the year 2012-2013!

- Math1003: about 600 students in Fall
- Math1013/Math1014: about 1770 students in Fall/1120 in Spring (The “new” calculus courses)
- Math2011: about 530 students in Fall/360 in Spring
- Math2111: about 460 students/320 in Spring

WeBWorK@UST continued to work well in 2013-2014, and more colleagues in the Math Dept have been gaining experience running a WeBWorK course.

WeBWorK and the Math Support Center at HKUST

WeBWorK@UST

Assessment and Administration

In a short talk of this workshop tomorrow morning, colleagues from CELT will share with you *“Some Assessments of WeBWorK and the MSC.”* (Wed 11:00-11:30 LTF)

For those who are interested in the administrative matters of the WeBWorK system, please join the brief presentation *“System Administration of WeBWorK and the MSC”* by our colleague Mr. Cook Wong tomorrow afternoon. (Wed 15:10-15:40 LTF)

WeBWork and the Math Support Center at HKUST

Other usages of online interactive homework systems in the past

Other than WeBWork, colleagues in the Math Dept had used other systems in their teaching:

- *Webquizzzer*. An online quiz system developed by Prof. Moy back in his days in the University of Michigan. The system was used in the early years of the 2000's to generate weekly quizzes for a business calculus course.
- Prof. S. Y. Cheng developed an interactive online homework system for a linear algebra course for math majors under a CELT grant.
- Prof. C. H. Fung used *MyMathLab* made available by Pearson in his multivariable calculus course for math majors.

In general, WeBWork is more flexible, and with more capabilities that we are yet to explore further.

WeBWork and the Math Support Center at HKUST

Online assessment by WeBWork?

Assessment is a key concern that any online interactive learning system must address.

So far, our usage of WeBWork at HKUST has been mainly on assigning and grading homework. A bit of adventuring into online quizzes in the MSC through WeBWork was just taken place in Spring 2014, in Math2111.

In the afternoon today, Prof. Robert Megginson of University of Michigan, the other keynote speaker of this workshop, will tell us more about gateway testing in his talk *“Gateway Testing in Mathematics, Past and Present”*. (Tue 14:15-15:15 LTF)

After Prof. Megginson’s talk, Dr. Jun Luo and Dr. Wing-Lung Lee will recall their first experience in arranging WeBWork quizzes in the MSC in a short session talk *“WeBWork Quizzes at HKUST”*.

WeBWorK and the Math Support Center at HKUST

Writing WeBWorK questions:

The hard work we've been avoiding

The problem library in WeBWorK has a large amount of math questions contributed by the system developers and many other users.

We have not been trying to write a lot of new questions, but from time to time we would modify existing questions whenever necessary.

At some point in the future, we may need to start writing some WeBWorK questions to deal with the diverse background of our students and necessary adjustments in the curriculum.

Prof. Gage's second talk tomorrow will let us know more about: *"The Old And The New In Authoring WeBWorK Questions"*. (Wed 14:00-15:00 LTF)

WeBWorK and the Math Support Center at HKUST

A blending of classroom teaching, online homework system and Math learning support

“The math skills of (university/school) students are declining.”

On departmental level:

Other than introducing more bridging courses, or “reforming” the curriculum, a common practice in many universities around the world is the introduction of a drop-in Math Support Center.

Depending on resources available, a Math Support Center could be

- a small/medium size room with tables and chairs
- or a large room with tables and chairs, and/or equipped with some computers (status quo of our MSC)
- or a whole floor of space with all sorts of facilities

stationed with undergraduate/graduate tutors/helpers, and/or faculty members regularly/occasionally.

WeBWorK and the Math Support Center at HKUST

Math Learning Support

MSC at HKUST is still in its stage of development, since a trial start about 3 years ago.

In his talk “*Drop-In Mathematics Help Centers: The University of Michigan Math Lab*” tomorrow (Wed 9:45 – 10:45 LTF), Prof. Megginson is going to share the successful experience of the math learning support services at Michigan with us.

WeBWorK and the Math Support Center at HKUST

A look at the brief history of MSC at HKUST



The pre-history



MSC in borrowed space/time -
Classroom A, LC



MSC
in transition

WeBWork and the Math Support Center at HKUST

WeBWork@UST  MSC:

A blending of WeWork with math learning support to enhance student learning

During the pilot run of WeBWork in Spring 2012, the Math Dept started in parallel a trial run of a Math Support Center in the HKUST Library.

Briefly, we were able to reserve Classroom A in the newly established Library Learning Commons for Mon/Wed/Thu each week, 3:00pm – 6:00pm.

It was primarily for the Math2111 students, but Math2011 students were also welcome. The MSC staff were mainly the graduate teaching assistants, some undergraduate tutors, and course instructors.

After gaining some experience of running an MSC, and some initial satisfactory results, with the help and support of CELT, a 3 year plan to upgrade the MSC was submitted to the University.

Funding was then granted to the Math Dept to carry out the plan.

WeBWorK and the Math Support Center at HKUST

Math Support Center at HKUST

In the Library and Math Computer Lab

The official MSC project started finally in Fall 2012, again in Classroom A, Library Learning Commons, and also in our Math Computer Lab, in extended periods.

Fall 2012

- Math Computer Lab: Mon-Fri 12:00pm-2:00pm
- Library: Mon-Thu 3:00pm-6:00pm, Fri 9:00am-12:00pm

Spring 2013

- Math Computer Lab: Mon-Fri 12:00pm-2:00pm
- Library: Mon-Thu 3:00pm-6:00pm, Tue-Wed 7:00pm-9:00pm

Fall 2013

- Library: Tue-Thu 3:00pm – 7:00pm
- Tutorial Spaces (Library): Mon-Fri 12:00pm-2:00pm

http://www.youtube.com/watch?v=I3IWSwzO0Uc&list=P LkBFsfearOmHcpsY_q0O7Fkl2K5hYmHOb

WeBWork and the Math Support Center at HKUST

Math Support Center at HKUST

The current MSC

In late Fall 2013, after the completion of the LSK building and IAS-HKUST, we were able to get hold of Room 2612AB for about 1 year, with the support and help of Dr. David Mole, our Associative Vice-President for Academic Affairs.

Since then MSC has moved to the current location, equipped with about 20 computers.

Spring 2014

- MSC at Room 2612AB: Mon-Fri 11:00pm – 6:00pm

People working in MSC: Instructional assistants, course instructors.

And we now have a MSC manager, Dr. Jun Luo, to overlook the daily running of the MSC.

WeBWork and the Math Support Center at HKUST

Math Support Center at HKUST

Just a brief retrospect of Spring 2014

In Spring 2014, we had approximately 2600 visits to the current MSC by around 560 students.

As expected, peak periods remained as usual, i.e., before homework due days and exams.

Non-WeBWork course math students also came to study, or to seek help.

Just to mention one main problem that continues:

Some students would come completely unprepared, and asked our MSC staff to go through everything again. (Sometimes, it caused some tension.)

We are stilling trying to optimize the usage of MSC, and improving on the services to students. CELT is currently helping to design and run a training session for the MSC staff for better working relationship with the students.

WeBWorK and the Math Support Center at HKUST

Math Support Center at HKUST

Not yet the end!

We are still somewhere in the middle to secure a permanent site for the MSC, and continuous support and funding from the University after the 3 year trial.

Finally, just to recall that there will be a “*Discussion Session*” tomorrow, Wed 11:40-12:25. You are all welcome to join and share with us your comments, questions, and ideas.

WeBWorK and the
Math Support Center at
HKUST

Thank you!