Open Calculus: Reducing Costs, Not the Learning

A tale of 2 courses...

Dr Phillip G Clark – Scottsdale Community College
James Souse – Phoenix College

Maricopa Community Colleges

10 Colleges

37 Associate Degrees

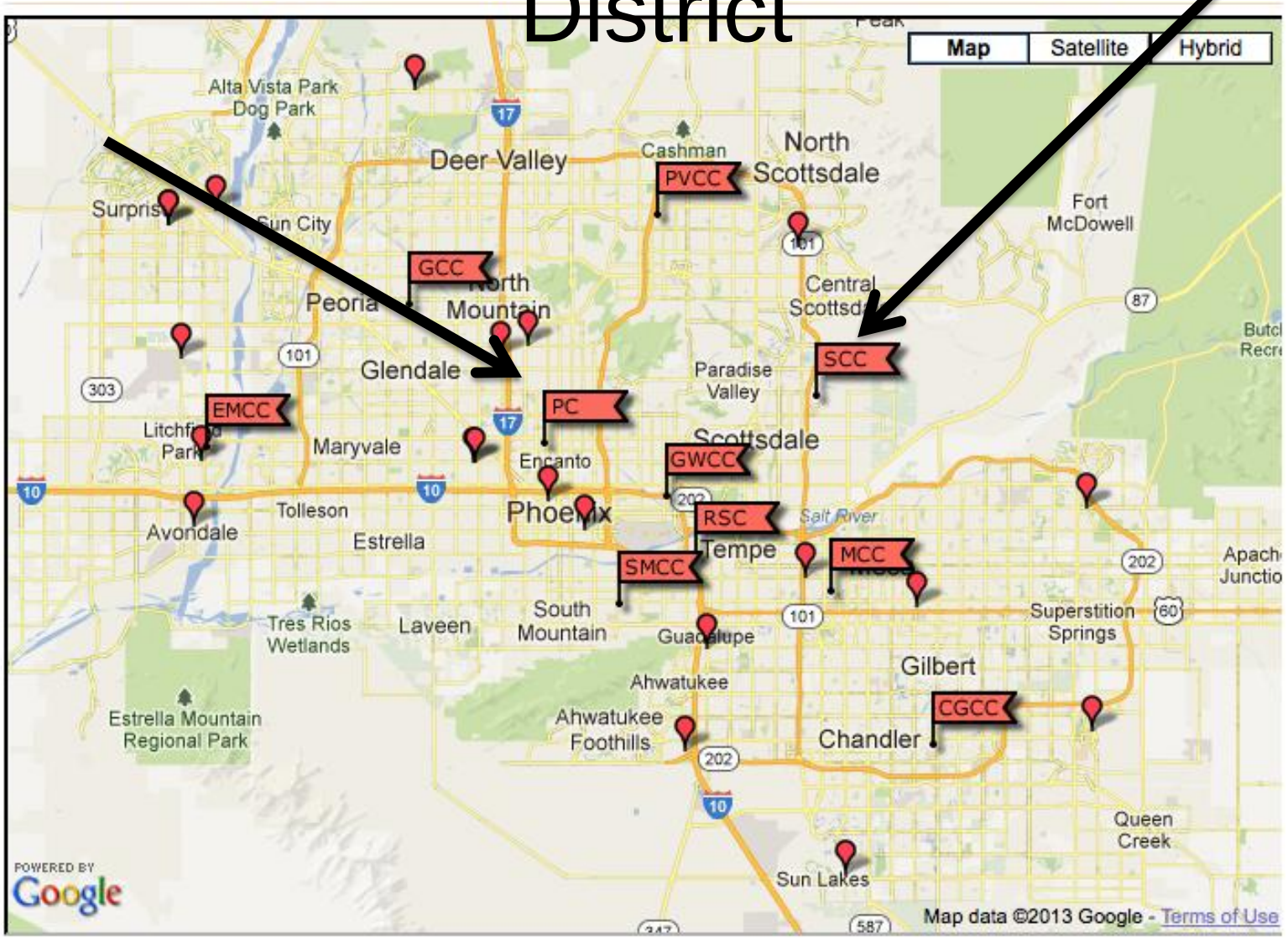
Over 10,000 Courses

Nearly 10,000 Employees

More than 250,000 Students

MARICOPA COMMUNITY COLLEGES®
The college of you.

One of 10 Colleges – Maricopa Community College District



Photos courtesy of www.scottsdalecc.edu

SCC is the only community college in the United States located on an Indian reservation

SCC is located on the Salt River Pima-Maricopa Indian Reservation

Photos courtesy of www.scottsdalecc.edu

We are the Scottsdale Community College **Fighting** Artichokes

And our mascot is Artie the Artichoke

Photos courtesy of www.scottsdalecc.edu

We are the only college in the country that offers an associates degree in DJing

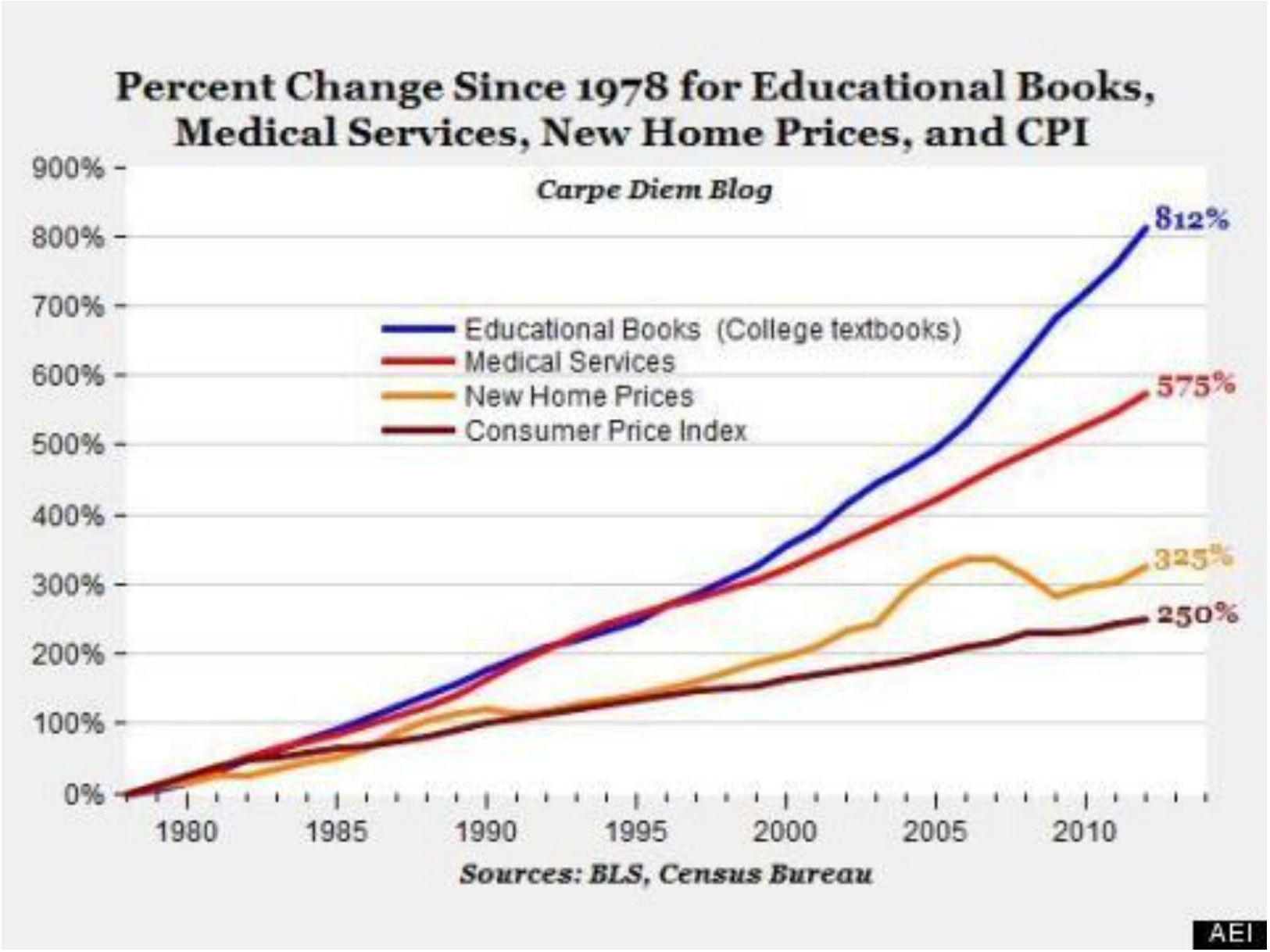


Image from the Huffington post 3/21/14
http://www.huffingtonpost.com/2013/01/04/college-textbook-prices-increase_n_2409153.html

Frustration with the Rising cost of education

- Consumer Price Index 2007 - 2011
  - The cost for Educational Books and Supplies has risen 26%
  - The cost for Tuition has risen 21%
- National Center for Education Statistics
  - Average earnings for college students have dropped by 3%

WhereTextbookdollargoes

{ Where the **New Textbook Dollar** Goes }

{ College Store }

10.8¢ College Store Personnel

1.7¢ Freight Expense

7.2¢ College Store Operations

4.4¢ College Store Income

7¢ Publisher's Income

32.1¢ Publishing Paper Printing, Editorial Costs

11.6¢ Author Income

9.9¢ Publishers General & Administrative

15.3¢ Publishing Marketing Costs

{ Publisher }

Attempts to contain costs

- Containing costs has been difficult.
  - New Editions are released with no significant added value.
  - Used books are often unavailable due to
    - Discontinuation by the bookstore
    - Design of the book itself
    - Need for an Online Software Package
  - Attempts to teach a course without a textbook
    - Limits the resources available to the student
    - Places a much greater workload on faculty
    - Increases printing costs for the college
  - Students do not purchase materials
    - This can have a significant affect on student success

U.S.News & World Report Store

NEWS

Report: High Textbook Prices Have College Students Struggling

The price of textbooks has increased 82 percent during the last decade, a new report finds.

Due to the high cost of textbooks, 65 percent of students said they decided against buying a book required for class. Of those students, nearly all (94 percent) said they were concerned that doing so would hurt their grade in a class.

"Not only are students choosing not to purchase the materials they are assigned by their professor, but they are knowingly accepting the risk of a lower grade to avoid paying for the textbook," the report said.

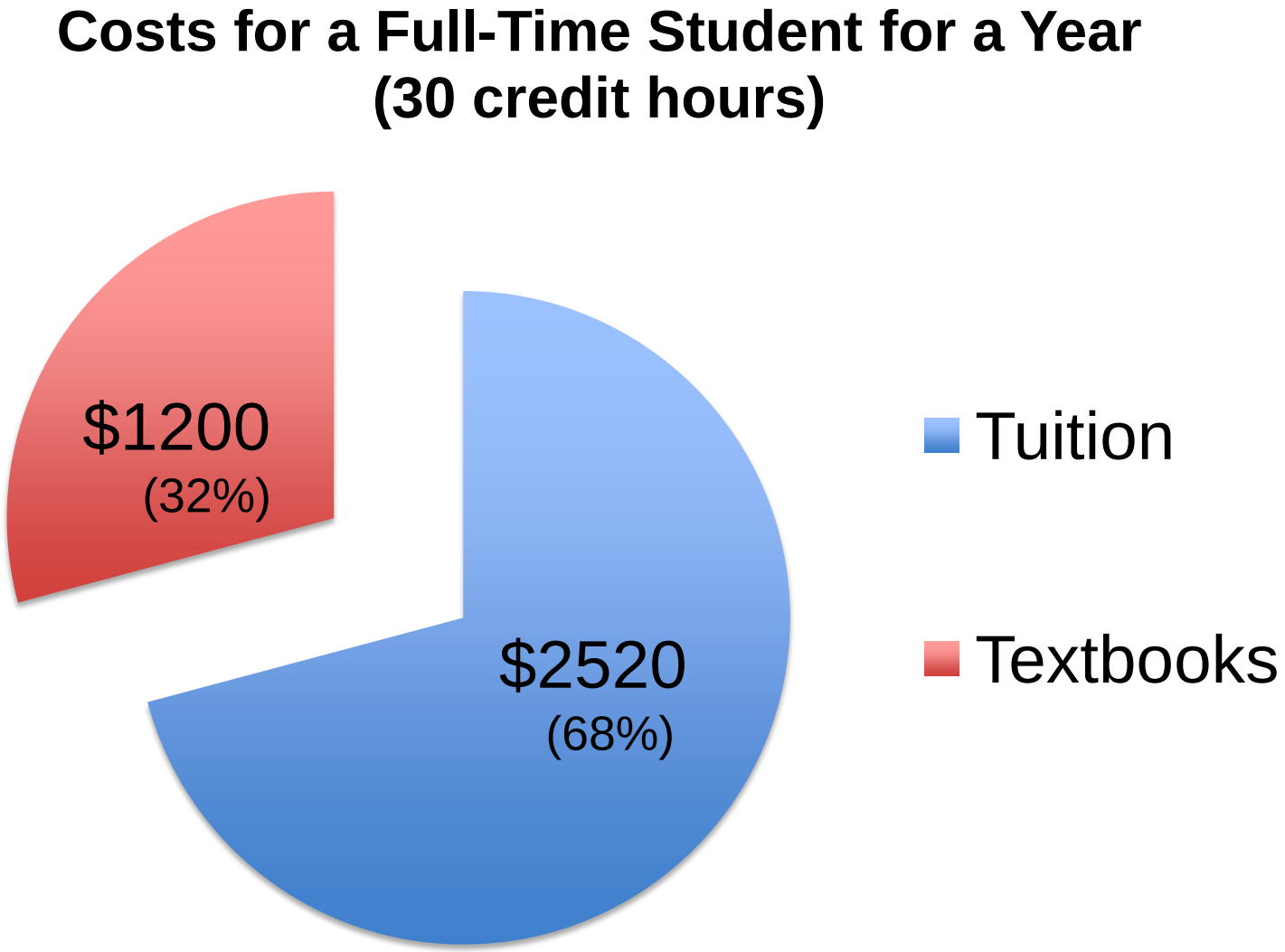
http://www.usnews.com/news/articles/2014/01/28/report-high-textbook-prices-have-college-students-struggling

Effects of these costs

- US PIRG Report, January 30th, 2014
  - *Survey of 2,039 students from more than 150 different university*

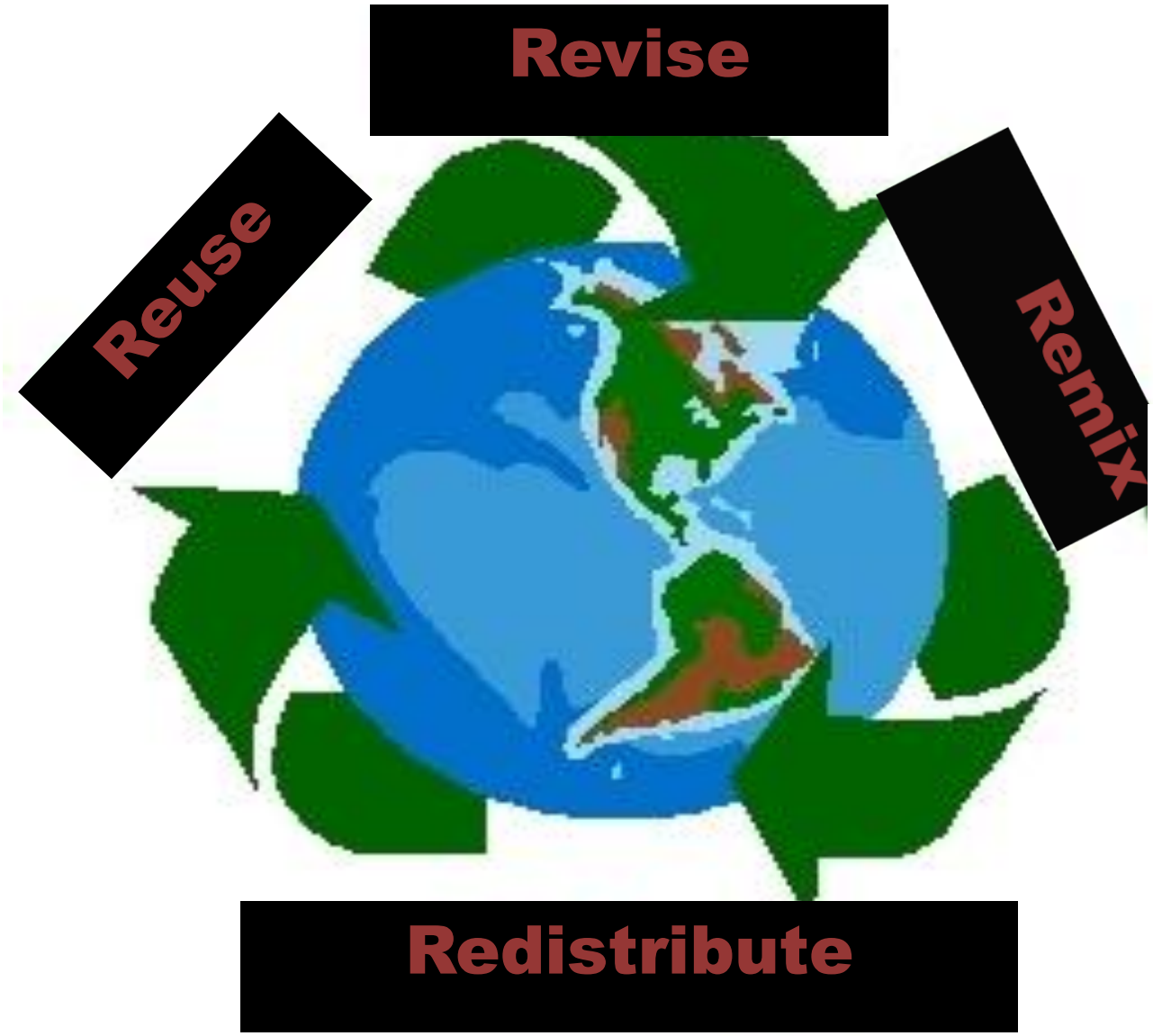
- 65% of students choose not to buy a college textbook because it's too expensive
- 94% report that they suffer academically because of this choice
- 48% say they altered which classes they took based on textbook costs, either taking fewer classes or different classes
- "According to the students surveyed in this report, the rising cost of textbooks not only adds to the overall financial burden of attending college, it can also have a measurably negative impact on their academic performance and student outcomes."
- 82% of students say they would do significantly better in a course if the textbook were free online and a hard copy was optional!

Maricopa Community Colleges



Open educational resources

- During this same time period, Open Educational Resources (OER) have become more established and relevant.
  - 2006, MathAS, a free web based Mathamatics Assessment Tool for online tests and homework
  - 2007, CK-12, an organization providing open content, web based digital textbooks
  - 2007, Open Educational Resource Commons. An organization that provides a single point of access through which educators and learners can search across collections to access over 30,000 items
- The Open Educational Resource movement includes:
  - Rice, Connexions
  - MIT, OpenCourseWare Project
  - Utah State University, Open CourseWare Project
  - University of California, Irvine
  - Gates Foundation
  - Hewitt Foundation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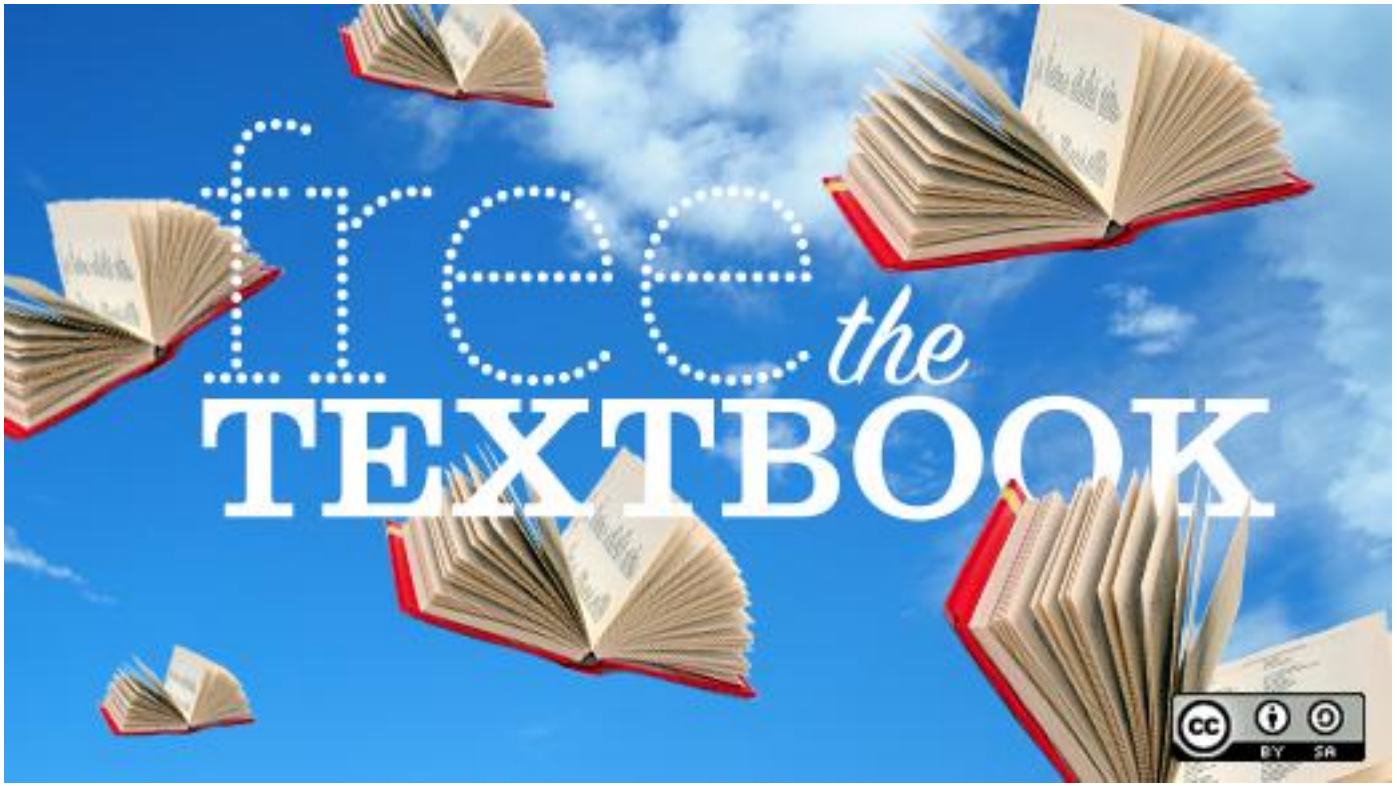
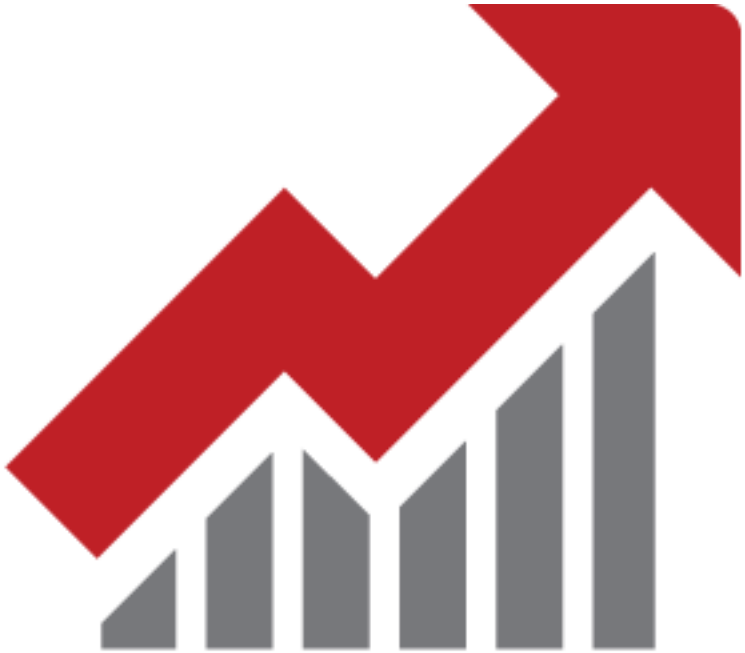
maricopa millions

Saving Students Money With Open Educational Resources

www.maricopa.edu/oer



Creating OER Awareness and Increasing Adoption



SCALING UP

- Presentations
- Call for OER Grants
- Dialogue Days
- Department Meetings
- “Water Cooler” Discussions
- Promotional Items
- CTLs
- College Libraries

http://www.skmurphy.com/startup-stages/scaling-up-stage/

maricopa millions

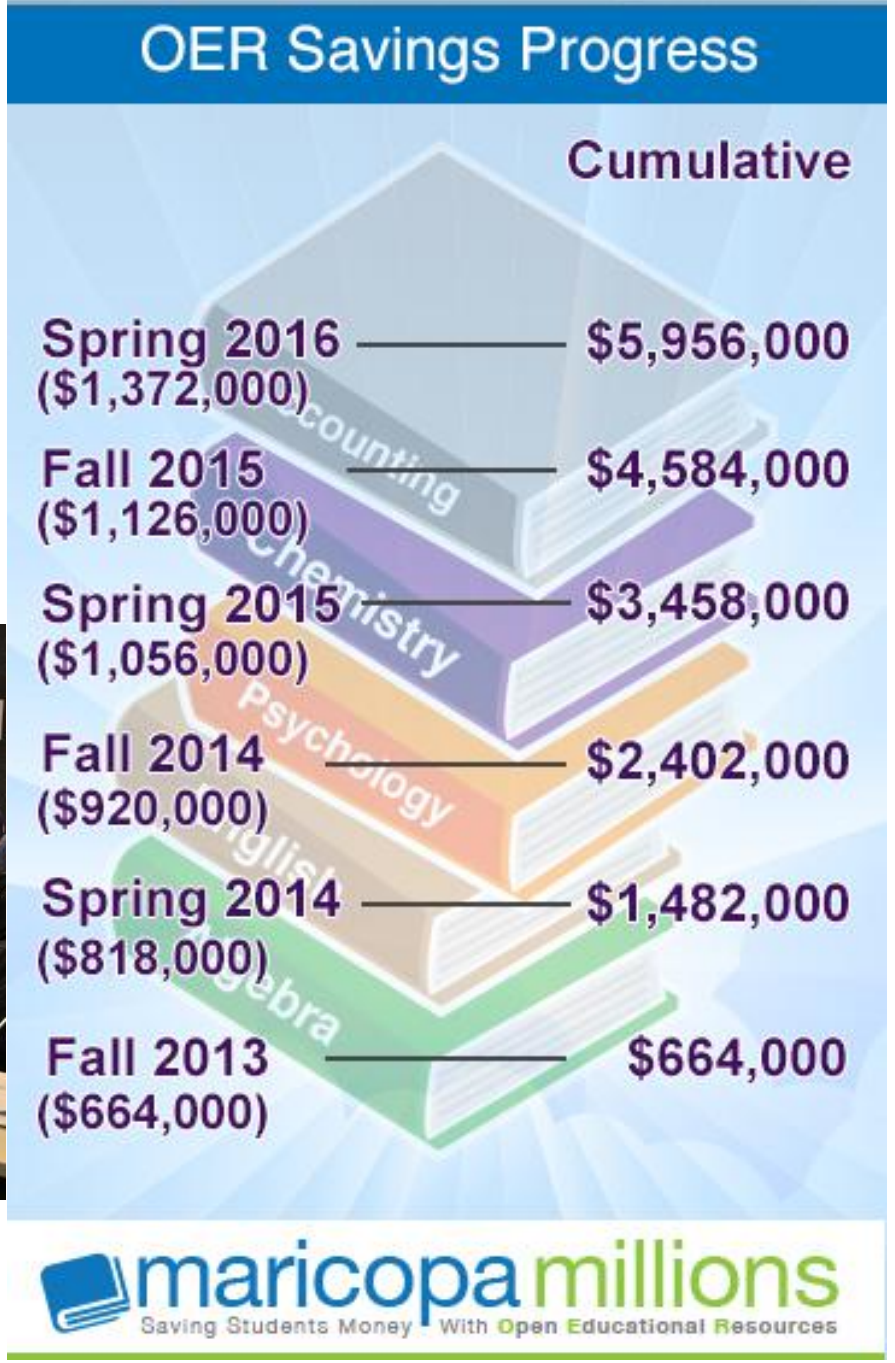
Saving Students Money With Open Educational Resources

GOAL **Save Maricopa Community College Students $5 Million over 5 Years**

- Collaborative teams of Faculty
- Multi-college proposals encouraged

- Evaluated by Steering Team
- Peer-reviewed Course Materials

Progress Toward the Goal



STUDENT AWARENESS

Find a Class

Keywords, Course # or SUN #

Course Subject

Any

Misc. Search Options

Classes Starting After

09/29/2014

format: 09/29/2014

Instructor

Show Only:

- [ ] SUN System Courses
- [ ] Honors Classes
- [ ] Open Entry / Open Exit Courses
- [x] No cost or low cost (<$40) textbooks

classes.sis.maricopa.edu

First-Year Composition (ENG101) 3 Credits

Emphasis on rhetoric and composition with a focus on expository writing and understanding writing as a process. Establishing effective college-level writing strategies through four or more writing projects comprising at least 3,000 words in total. Prerequisites: Appropriate writing placement test score, or a grade of "C" or better in ENG091 or ESL097.

General Education Designations: FYC

SUN # ENG1101

Class#	Semester	Location	Delivery	Dates	Days	Times	Instructor	Availability
31965	Fall 2014	Paradise Valley M 226 - Classroom	In Person	08/25/2014-12/19/2014	M,W	10:30AM-11:45AM	L. McClelland	Class Started Contact Enrollment Services for Registration Assistance

Notes

All textbook and course materials available at no or low cost (<$40) - may include OER (Open Educational Resources).
Class 31965 costs include Data Processing Class Fee: $5

0 Books

Scottsdale Community College

Launch

- Spring 2012 the department chair asked, can we go completely OER for our Traditional Classes from Basic Math through Trig?
- The Department said yes.
- **What was the impact?**

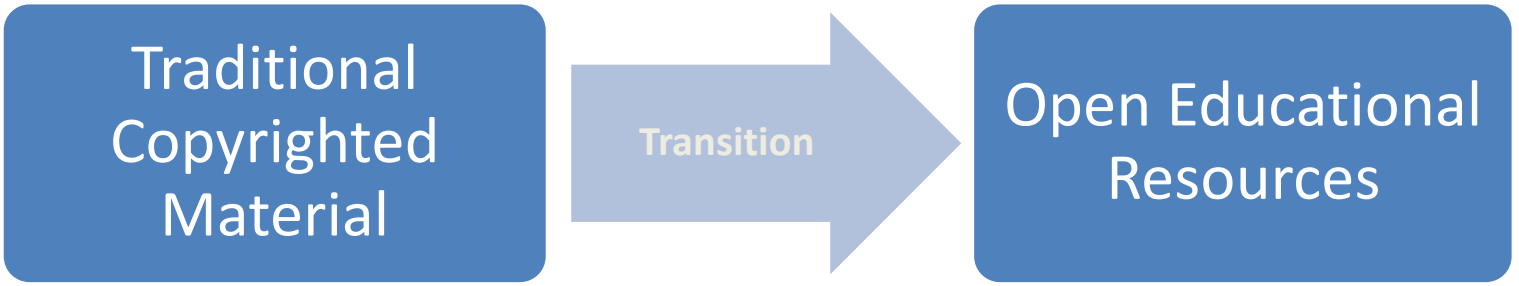
Introductory Algebra	Intermediate Algebra	College Algebra
1250 Students	1352 Students	701 Students

Learning Resources

Text Book and Interactive Learning Environment Package Wiley and Pearson Education

$110.26 per Student

$364,173.50 per Year



Learning Resources

OER Text Book and Interactive Learning Environment

Maximum of $15 per Student

86% decrease in costs

$313,189 in savings

Calculus at SCC

- Textbook
- Online Lessons
- Online Homework
- Homework Assistance
- Interactive Apps
- Problem Solving

Textbook

MB $0.02 Letters of Rec Teaching Scholarship Open Calculus

Active Calculus

endorsed by the American Institute of Mathematics

Files for Download

(last update: 12.30.13)

He has also come out with a Multivariable edition that is in its first iteration

Active Calculus Activities ch 1-8 (v.12.30.13).pdf

Active Calculus ch 1-4 (v.12.30.13).pdf
Active Calculus Activities ch 1-4 (v.12.30.13).pdf

Active Calculus ch 5-8 (v.12.30.13).pdf
Active Calculus Activities ch 5-8 (v.12.30.13).pdf

If you have questions or difficulties regarding any of the above, please contact me directly at boelkinm at gvsu dot edu.

Exercises

1. Consider the c … > 0.

   (a) Sketch … cubic poly-nomial …

   (b) Find al …

   (c) Compu … ond deriva-tive sig …

   (d) Descril … change as a change … values and inflecti … rcises

2. Let $q(x) = \frac{e^{-}}{x -}$ …

   (a) Explai …

   (b) Determ …

   (c) Compu …

   (d) Constr … ritical value results …

   (e) Sketch … viors clearly labeled …

   (b) … ind the …

No… …)^2.

Sub…

Active Calculus

A Creative Commons License!

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http://faculty.gvsu.edu/schlicks/

December 30, 2013

Calculus at SCC

- Textbook ✓
- Online Lessons
- Online Homework
- Homework Assistance
- Interactive Apps
- Problem Solving

- Active Calculus

Online Lessons

Switching Between the Forms

Now our goal is to undo the chain rule to determine a new antiderivative rule. To accomplish this, we take the antiderivative of both sides of the chain rule:

$$\int \frac{d}{dx} f(g(x))dx = \int f'(g(x)) \cdot g'(x)dx$$

$$f(g(x)) = \int f'(g(x)) \cdot g'(x)\,dx$$

SoftChalk allows for questioning, embedding of videos, and access to course content outside of the classroom.

Scores can be directly input into most LMS (including MathAS)

- **a.** $(x^3+4)^6 \cdot 3x^2$
- **b.** $6(x^3+4)^5 \cdot 3x^2$
- **c.** $6(x^3+4)^5 \cdot 3x$
- **d.** $(3x^2)^6$

Check Answer

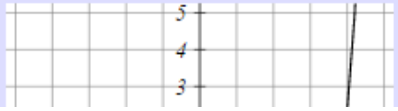
return to top | next page

Calculus at SCC

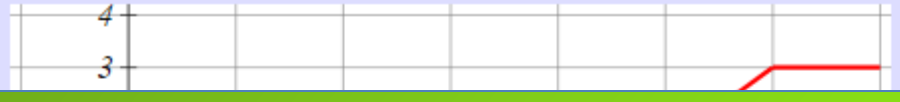
- Textbook ✓
- Online Lessons ✓
- Online Homework
- Homework Assistance
- Interactive Apps
- Problem Solving

- Active Calculus
- SoftChalk

This is the graph of a function.



Given the function graphed below, evaluate the definite integrals.



MathAS allow for many types of questions including numerical, algebraic, graphing, multiple choice and

Also instructors have the option of including help on problems in the form of videos, webpages, apps, etc

There is also flexibility in how answers must be entered including accuracy, simplification, ordered pairs, etc.

If yo

$\int_1 f(x)dx =$ Preview

Also

Get help: Video

Points possible: 6
Unlimited attempts.
Message instructor about this question

Question ID: 19764
License

Submit

udent

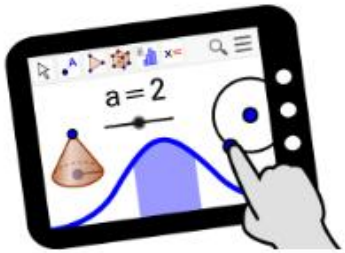
sword
name

check

, 2016

pman

GeoGebra + Materials Downloads Blog Help Sign in



Geogebra is FREE!!!

This problem has a Geogebra app embedded

GEOGEBRA

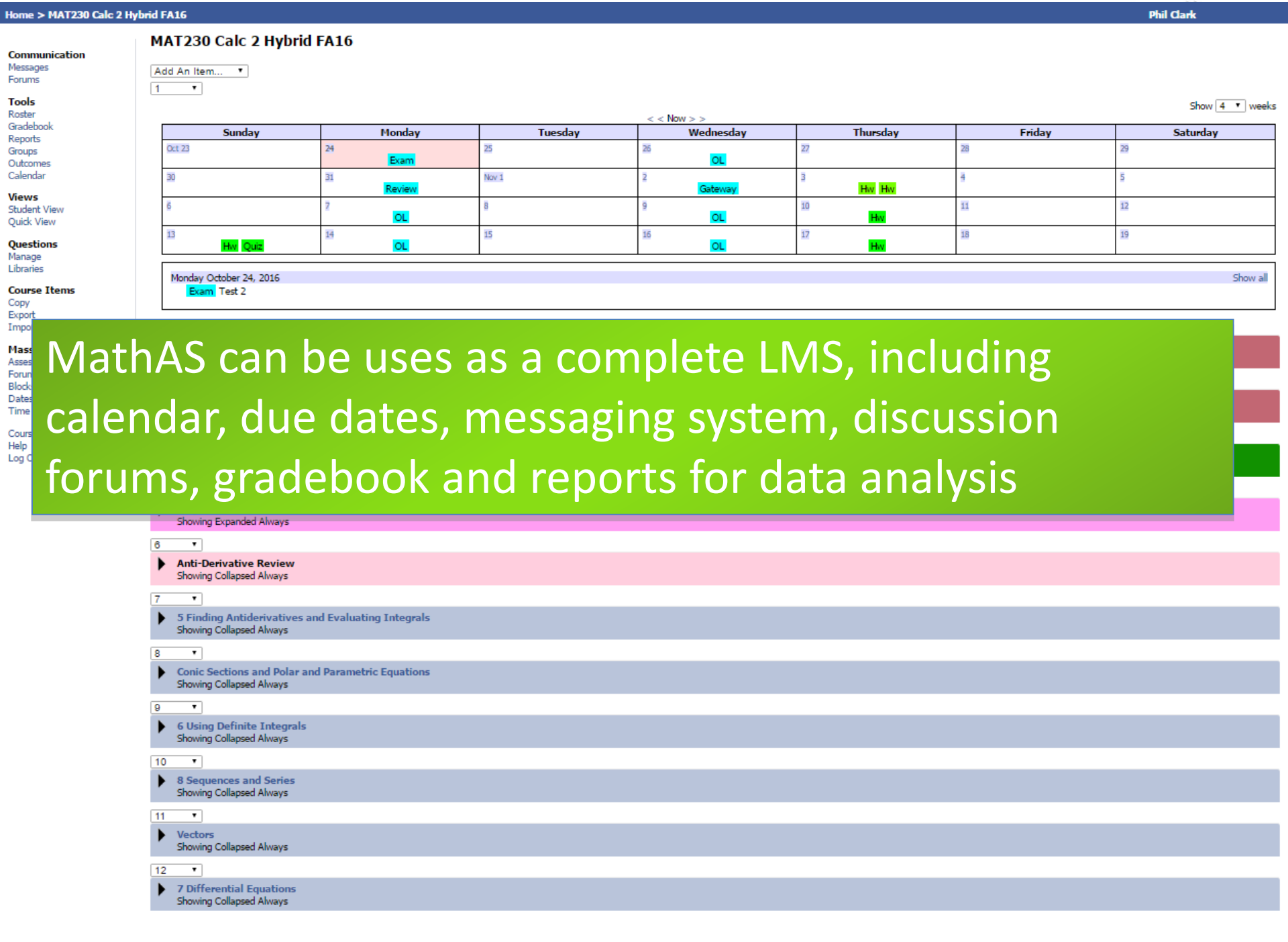
THE GRAPHING CALCULATOR FOR FUNCTIONS, GEOMETRY, ALGEBRA, CALCULUS, STATISTICS AND 3D MATH!

DYNAMIC MATHEMATICS FOR LEARNING AND TEACHING

#1 Students love it because...

#2 Teachers love it because...

#3 Schools love it because...


Home > MAT230 Calc 2 Hybrid FA16
Phil Clark
MAT230 Calc 2 Hybrid FA16
Communication
Messages
Forums
Tools
Roster
Gradebook
Reports
Groups
Outcomes
Calendar
Views
Student View
Quick View
Questions
Manage
Libraries
Course Items
Copy
Export
Add An Item...
Show 4 weeks
< < Now > >
Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Exam
OL
Review
Gateway
Hw
Quiz
Monday October 24, 2016
Show all
Exam Test 2
MathAS can be uses as a complete LMS, including calendar, due dates, messaging system, discussion forums, gradebook and reports for data analysis
Showing Expanded Always
Anti-Derivative Review
Showing Collapsed Always
5 Finding Antiderivatives and Evaluating Integrals
Showing Collapsed Always
Conic Sections and Polar and Parametric Equations
Showing Collapsed Always
6 Using Definite Integrals
Showing Collapsed Always
8 Sequences and Series
Showing Collapsed Always
Vectors
Showing Collapsed Always
7 Differential Equations
Showing Collapsed Always

Calculus at SCC

- Textbook ✓
- Online Lessons ✓
- Online Homework ✓
- Homework Assistance ✓
- Interactive Apps ✓
- Problem Solving

- Active Calculus
- SoftChalk
- MathAS
- YouTube Videos
- Geogebra, Desmos, etc.

Problem Solving

Calculus with Polar Coordinates - Length and Area **Name:** _____

Adapted by James Sousa and Phil Clark
from Contemporary Calculus by Dale Hoffman
(CC-BY)

1. Find the area of the shaded region in figure 20.

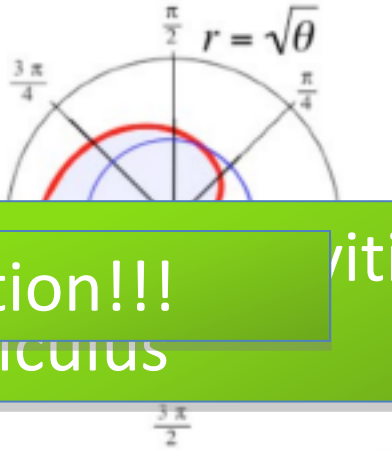


Fig. 20

As ... vities and exercises from Active Calculus

Many come via collaboration!!!

Calculus at SCC

- Textbook ✓
- Online Lessons ✓
- Online Homework ✓
- Homework Assistance ✓
- Interactive Apps ✓
- Problem Solving ✓

- Active Calculus
- SoftChalk
- MathAS
- YouTube Videos
- Geogebra, Desmos, etc.
- Textbook, Create own, collaborations, etc

Open Calculus at Phoenix College

AMATYC 2016

Why Use OER?

1. Everyone has access to the course materials before the first day of class.
   - Work on prerequisite review to determine readiness for calculus.
   - Become familiar with course format.
2. Cost Savings
   - OER text required cost: $0 Optional print copy of text: $12-$17 + shipping
   - Publisher text: $326.50 from bookstore (For Calc I-III)
3. No new editions allows focus on improving content each semester.

Mathispower4u.com

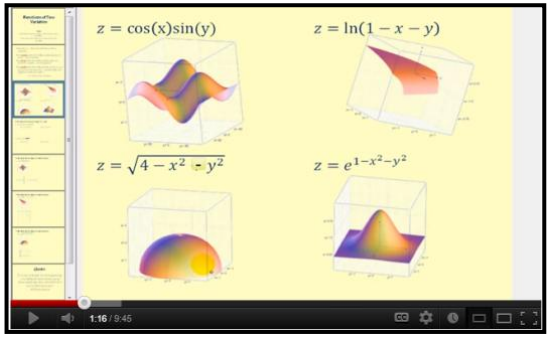
Arithmetic Through Calculus and Beyond

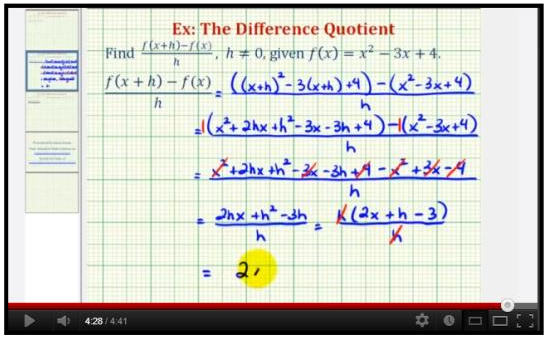
Complete Video Library

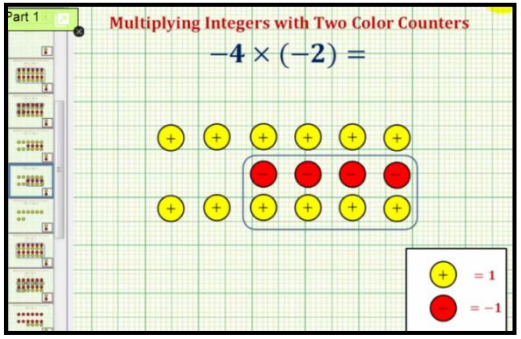
Over 5,000 Math Videos Lessons and Video Examples

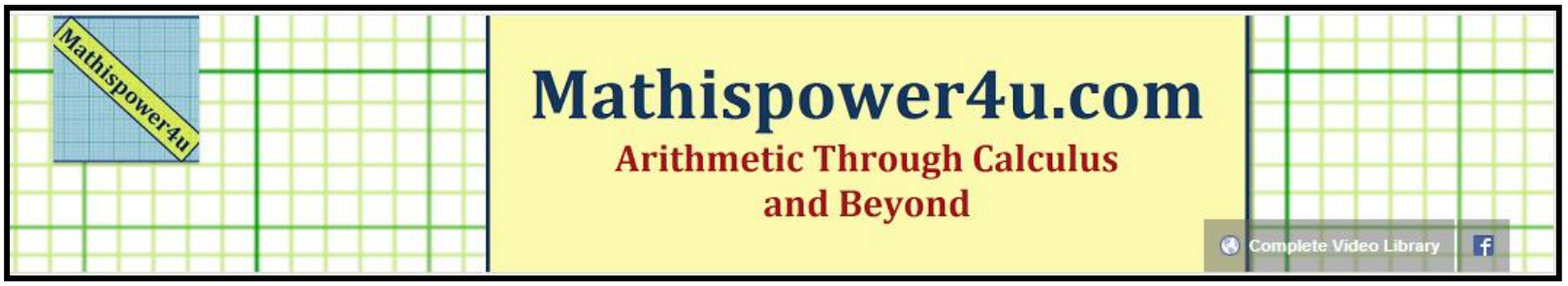
Most videos are closed captioned.

60,000+ subscribers with 40+ million total views

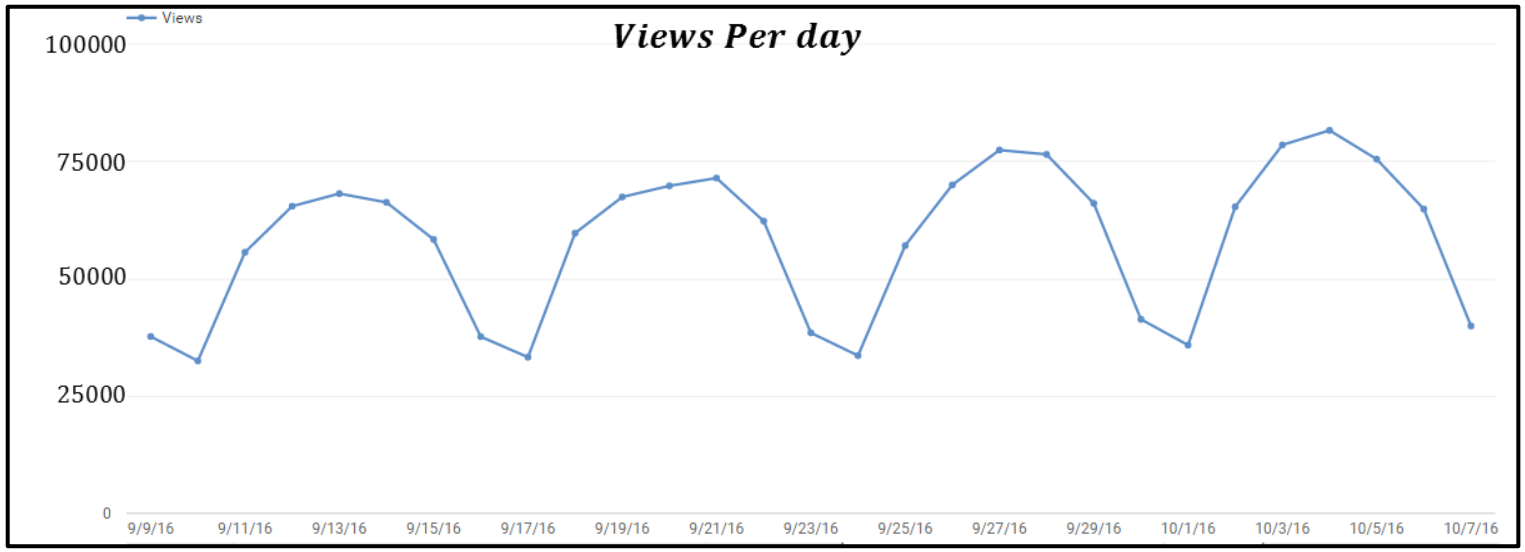






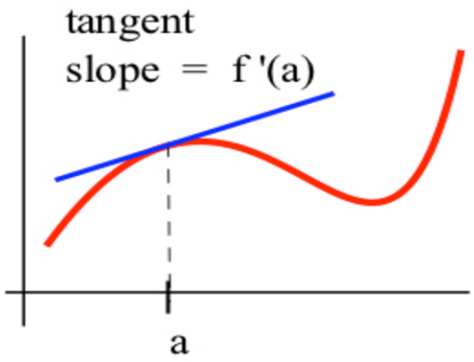


30 days has 3,878,914 minutes of view time ≈ 7 years 136 days of view time



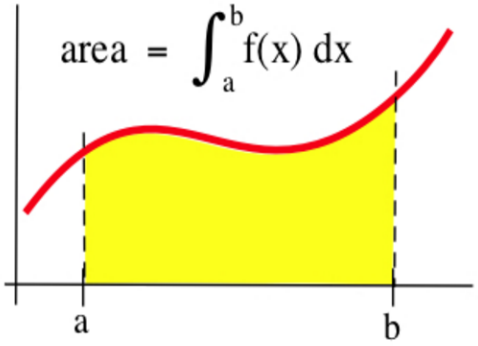
Geography	Watch time (minutes)
United States	3,243,317 (84%)
Canada	121,377 (3.1%)
Philippines	95,725 (2.5%)
India	84,266 (2.2%)
Malaysia	31,142 (0.8%)

Geography	Watch time (minutes)
Arizona	602,949 (19%)
California	445,141 (14%)
Washington	208,696 (6.4%)
New York	178,427 (5.5%)
Virginia	177,945 (5.5%)
Florida	170,865 (5.3%)
Texas	167,247 (5.2%)
Utah	158,790 (4.9%)
Maryland	105,075 (3.2%)
Georgia	90,179 (2.8%)



Contemporary Calculus

Dale Hoffman
Bellevue College
dhoffman@bellevuecollege.edu

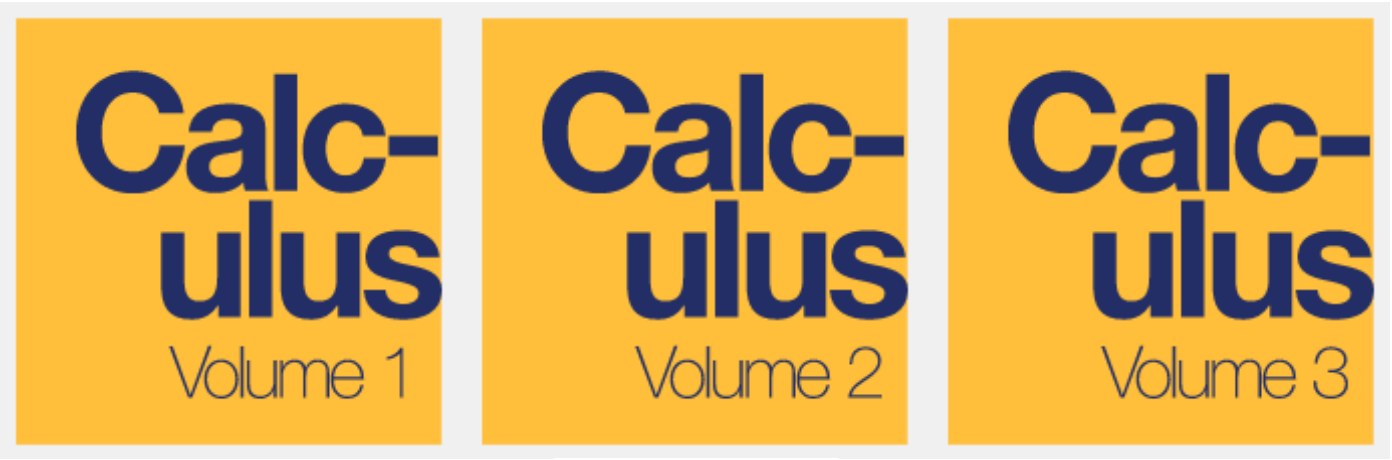


Many of these materials were developed for the Open Course Library Project of the Washington State Colleges as part of a Gates Foundation grant. The goal of this project was to create materials that would be FREE (on the web) to anyone who wanted to use or modify them (and not have to pay $200 for a calculus book). They have been used by several thousand students.

The textbook sections, in color, are available free in pdf format at the bottom of this page.
Printed versions, in B&W, are available for Calculus I (chapters 0-3), II (chapters 4-8), and III (chapters 9-11) for about $18 each at Lulu.com.
Alternate printed versions reformatted in LaTex are available at CreateSpace.com and Amazon.com or free online at ContemporaryCalculus.com.

New Calculus OER

openstax™



Calculus I Course Format

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Oct 2	3 Video Assn	4	5 Video Assn	6	7 Video Assn	8
9	10 Video Assn	11	12 Video Assn	13	14 Test	15
16	17	18	19 Take Home Midterm Proctored Midterm	20	21	22
23	24 Video Assn	25	26 Video Assn	27	28 Video Assn	29

Tuesday October 4, 2016 Show all

- Announcements New — Isolate
- Discussion Forums — Isolate
- Chapter 0: Orientation / Welcome to Calculus / Precalculus Review
- Chapter 1: Limits and Continuity
- Chapter 2: The Derivative
- Chapter 3: Derivatives and Graphs
- Chapter 4: The Integral
- Midterm / Final
- Calculus Proofs — Isolate

Chapter 1: Limits and Continuity

Chapter 1 Resources

- 1.0: Tangent Line, Velocities, and Growth
- 1.1: The Limit of a Function
- 1.2: Limit Properties
- 1.3: Continuous Functions
- 1.4: The Definition of a Limit

Optional Chapter 1 Review

Chapter 1 Test
Past Due Date of Mon 9/12/16, 11:59 pm. Showing as Review.
This assessment is in review mode - no scores will be saved

1.1: The Limit of a Function

Required Reading 1.1: Limit of a Function

Optional Book Assignment: 1-11, 13, 15, 17-20

Video Assignment 1.1: The Limit of a Function

Past Due Date of Fri 9/2/16, 11:59 pm. Showing as review.

This assessment is in review mode - no scores will be saved

Watch these videos before starting the Assignment.

Assignment 1.1: The Limits of a Function

Past Due Date of Fri 9/2/16, 11:59 pm. Showing as Review.

This assessment is in review mode - no scores will be saved

Questions

- Q 1 (0/10)
- Q 2 (0/10)
- Q 3 (0/10)
- Q 4 (0/10)
- Q 5 (0/10)
- Q 6 (0/10)
- Q 7 (0/10)
- Q 8 (0/10)
- Q 9 (0/10)
- Q 10 (0/10)
- Q 11 (0/10)

Review: 0/110

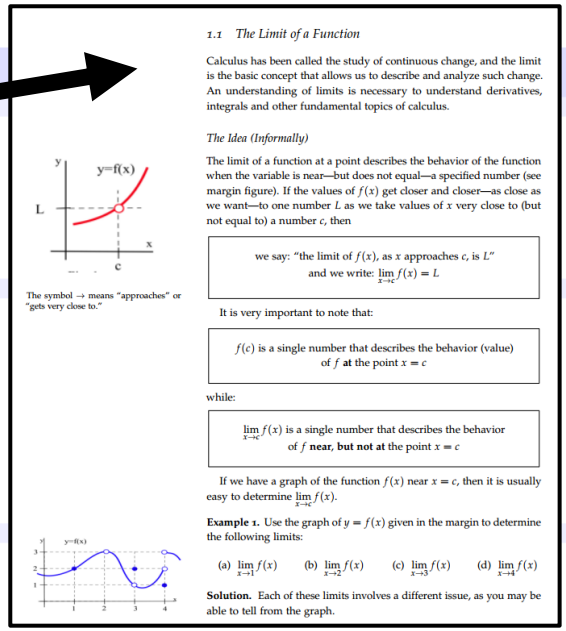
Evaluate the limit: $\lim_{x \to 8} \dfrac{x^2 - 12x + 32}{x - 8}$

Get help: Video

Show Answer

Points possible: 10
Unlimited attempts.
Post this question to forum

Submit



1.1 The Limit of a Function

Calculus has been called the study of continuous change, and the limit is the basic concept that allows us to describe and analyze such change. An understanding of limits is necessary to understand derivatives, integrals and other fundamental topics of calculus.

The Idea (Informally)

The limit of a function at a point describes the behavior of the function when the variable is near—but does not equal—a specified number (see margin figure). If the values of $f(x)$ get closer and closer—as close as we want—to one number L as we take values of x very close to (but not equal to) a number c, then

we say: "the limit of $f(x)$, as x approaches c, is L"
and we write: $\lim_{x \to c} f(x) = L$

The symbol $\to$ means "approaches" or "gets very close to."

It is very important to note that:

$f(c)$ is a single number that describes the behavior (value) of f **at** the point $x = c$

while:

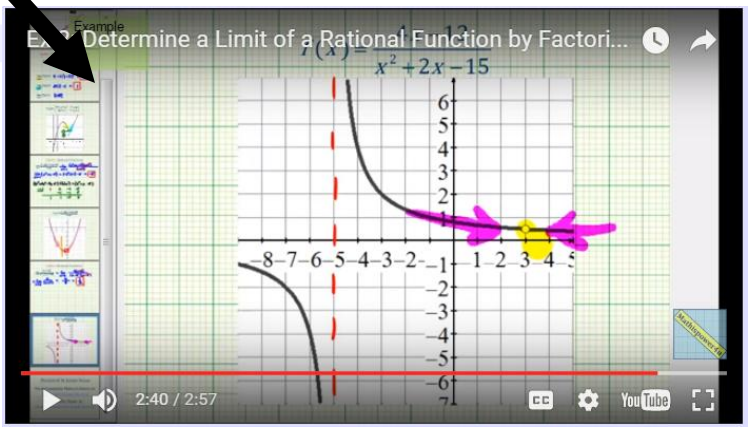
$\lim_{x \to c} f(x)$ is a single number that describes the behavior of f **near, but not at** the point $x = c$

If we have a graph of the function $f(x)$ near $x = c$, then it is usually easy to determine $\lim_{x \to c} f(x)$.

Example 1. Use the graph of $y = f(x)$ given in the margin to determine the following limits:

(a) $\lim_{x \to 1} f(x)$ (b) $\lim_{x \to 2} f(x)$ (c) $\lim_{x \to 3} f(x)$ (d) $\lim_{x \to 4} f(x)$

Solution. Each of these limits involves a different issue, as you may be able to tell from the graph.



Questions

- Q 1 (0/10)
- Q 2 (0/10)
- Q 3 (0/10)
- Q 4 (0/10)
- Q 5 (0/10)
- Q 6 (0/10)
- Q 7 (0/10)
- Q 8 (0/10)
- Q 9 (0/10)
- Q 10 (0/10)
- Q 11 (0/10)

Review: 0/110

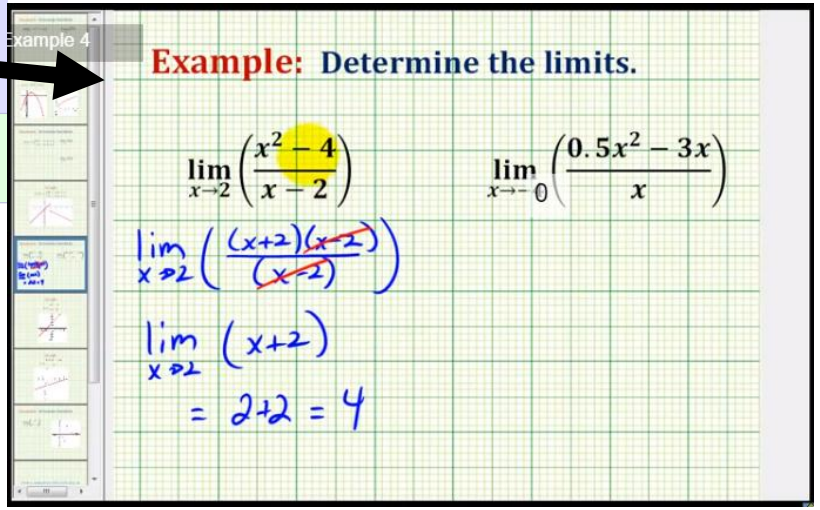
Evaluate the limit: $\lim_{x \to 8} \dfrac{x^2 - 12x + 32}{x - 8}$

Get help: Video

Show Answer

Points possible: 10
Unlimited attempts.
Post this question to forum

Submit



Subject: Question about #3 in Assignment 1.1: The Limits of a Func

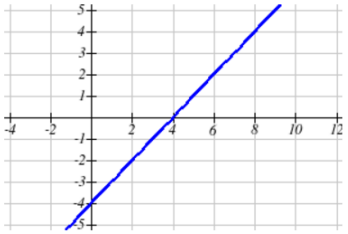
Message:

Edit Insert Formats

I'm confused by this question. The function is undefined at x = 8?

$f(8) = \dfrac{(8)^2 - 12(8) + 32}{8 - 8} = \dfrac{0}{0} = ?$

I'm also confused by the graph. Why is the function a line?



Evaluate the limit: $\lim_{x \to 8} \dfrac{x^2 - 12x + 32}{x - 8}$

p

Post Thread

Chapter 1 Resources

Chapter 1 Book Odd Problem Answers

Answers to most odd-numbered HW problems from Chapter 1. (A reformatted version will be available soon.)

Section Notes

Section Notes

You will need to download the file. Then open with adobe reader. Under view menu, you will need to rotate the view.

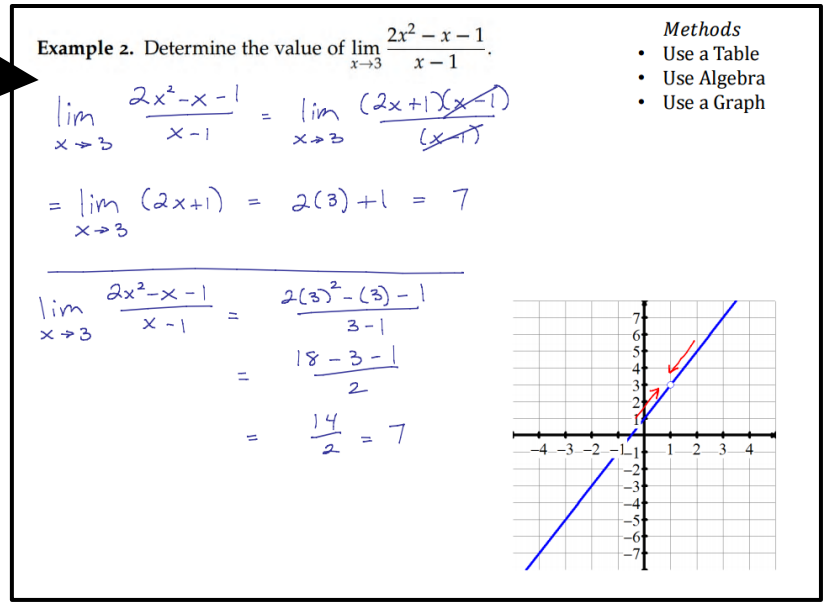
1.0 Tangent Lines, Velocities, Growth

1.1 The Limit of a Function

1.2 Properties of Limits

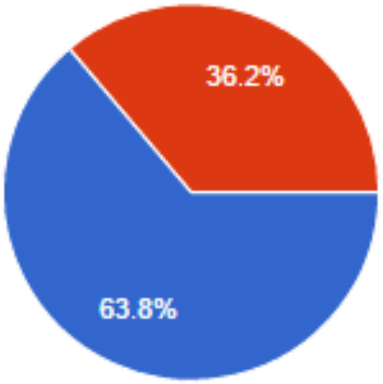
1.3 Continuous Functions

1.4 Definition of Limit



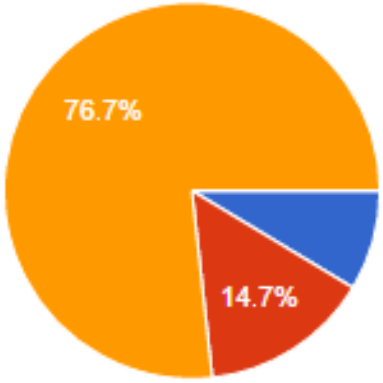
OER Calculus Survey (n=116)
Spring 2016: n=43 Fall 2016: n = 73

Course



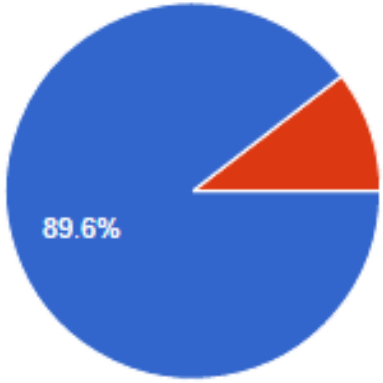
Calculus 1	**74**	63.8%
Calculus 2	**42**	36.2%

Type of Class



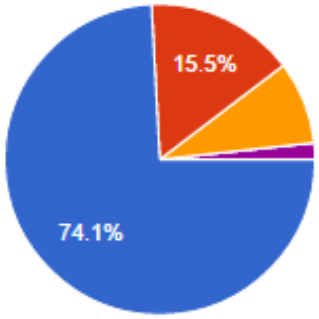
Face to face	**10**	8.6%
Hybrid	**17**	14.7%
Online	**89**	76.7%

Instructor



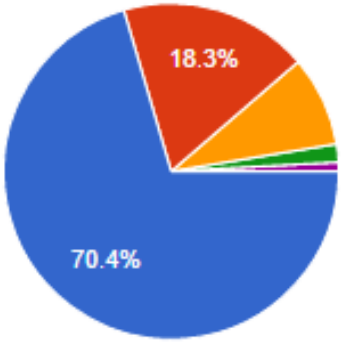
James Sousa	**103**	88.8%
Phillip Clark	**12**	10.3%

How important is it to you that the courses are taught using OER (low cost or no cost course materials)? Please rate from 5 to 1. (5 = very important and 1 = not important)



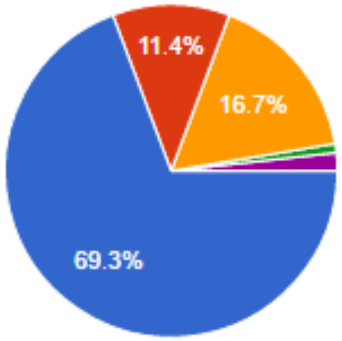
5	**86**	74.1%
4	**18**	15.5%
3	**10**	8.6%
2	**0**	0%
1	**2**	1.7%

How likely would you be to seek out another course taught with OER (low cost or no cost course materials)?



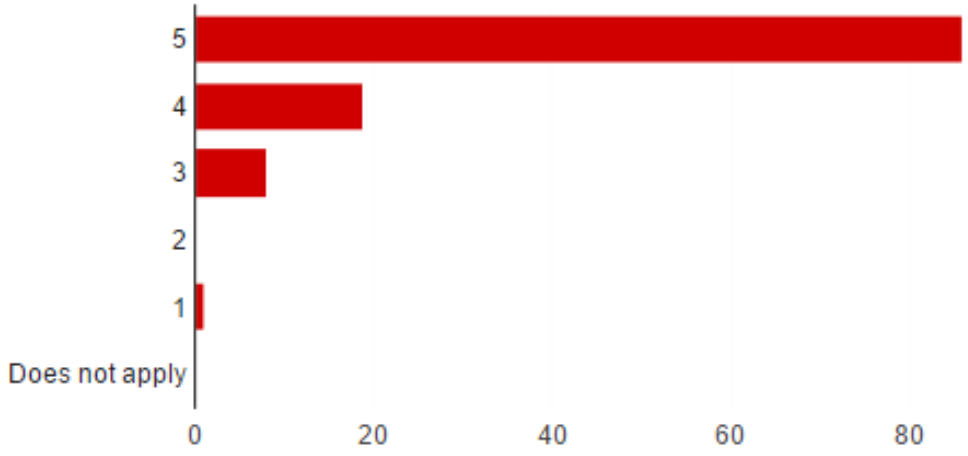
5	**81**	70.4%
4	**21**	18.3%
3	**10**	8.7%
2	**2**	1.7%
1	**1**	0.9%

How would you rate the quality of the free course materials of this class compared to other math courses you have taken that used publisher materials you had to buy?



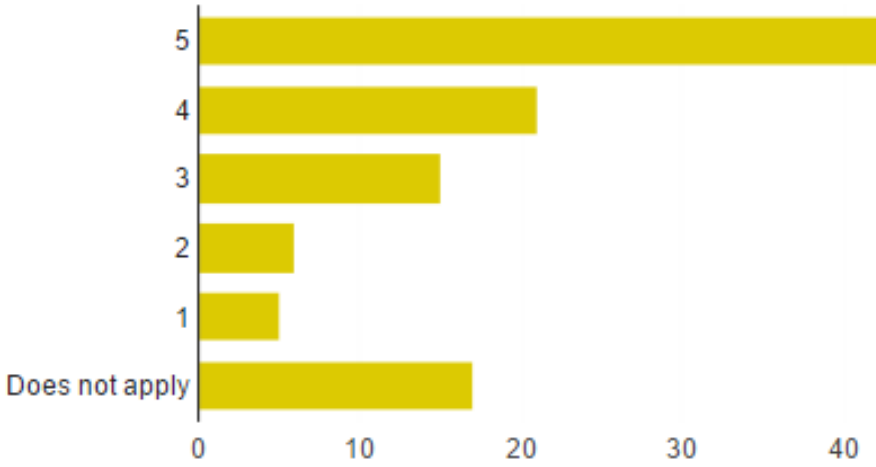
The course materials for this class are better quality than publisher materials.	**79**	69.3%
The course materials for this class are slightly better quality than publisher materials.	**13**	11.4%
The course materials for this class are same quality as publisher materials.	**19**	16.7%
The course materials for this class are slightly lower quality than publisher materials.	**1**	0.9%
The course materials for this class are lower quality than publisher materials.	**2**	1.8%

Online Course Organization and Format [Please rate the quality/usefulness of the course components. 5 = highest to 1 = lowest]



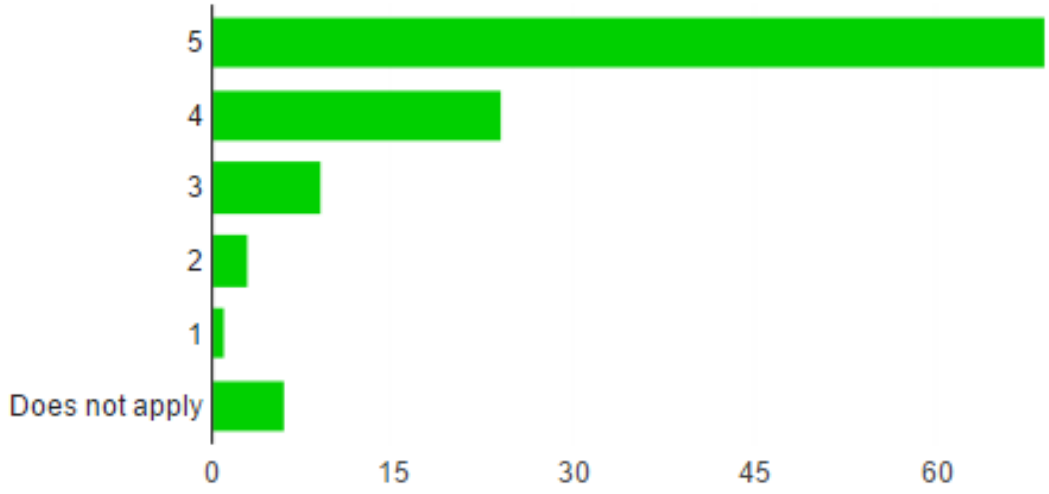
5	**86**	75.4%
4	**19**	16.7%
3	**8**	7%
2	**0**	0%
1	**1**	0.9%
Does not apply	**0**	0%

ebook [Please rate the quality/usefulness of the course components. 5 = highest to 1 = lowest]



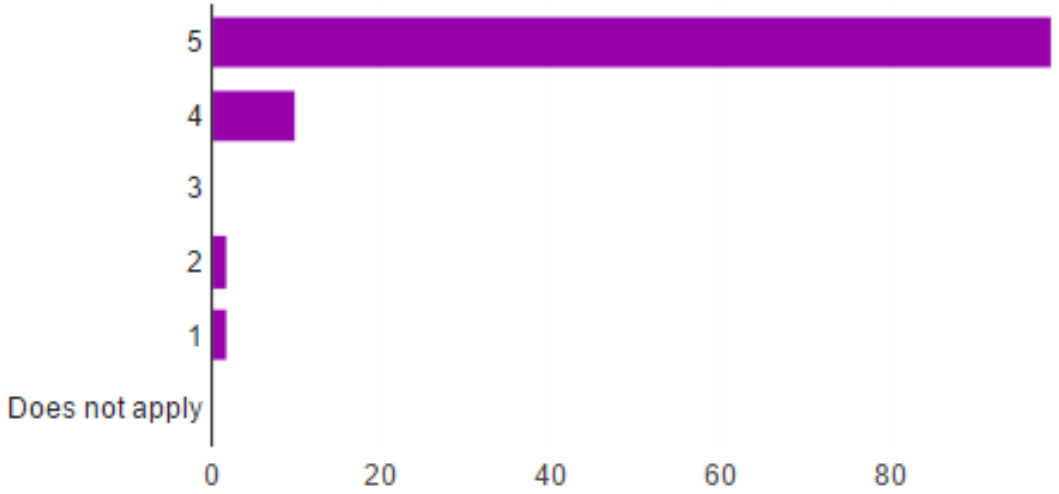
5	**49**	43.4%
4	**21**	18.6%
3	**15**	13.3%
2	**6**	5.3%
1	**5**	4.4%
Does not apply	**17**	15%

Chapter Notes [Please rate the quality/usefulness of the course components. 5 = highest to 1 = lowest]



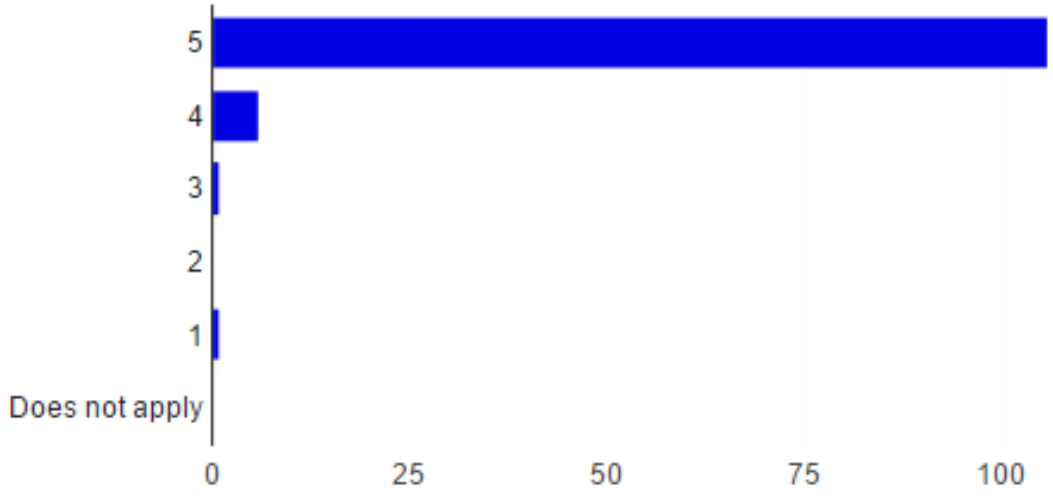
5	**69**	61.6%
4	**24**	21.4%
3	**9**	8%
2	**3**	2.7%
1	**1**	0.9%
Does not apply	**6**	5.4%

Video lessons/Online lessons [Please rate the quality/usefulness of the course components. 5 = highest to 1 = lowest]



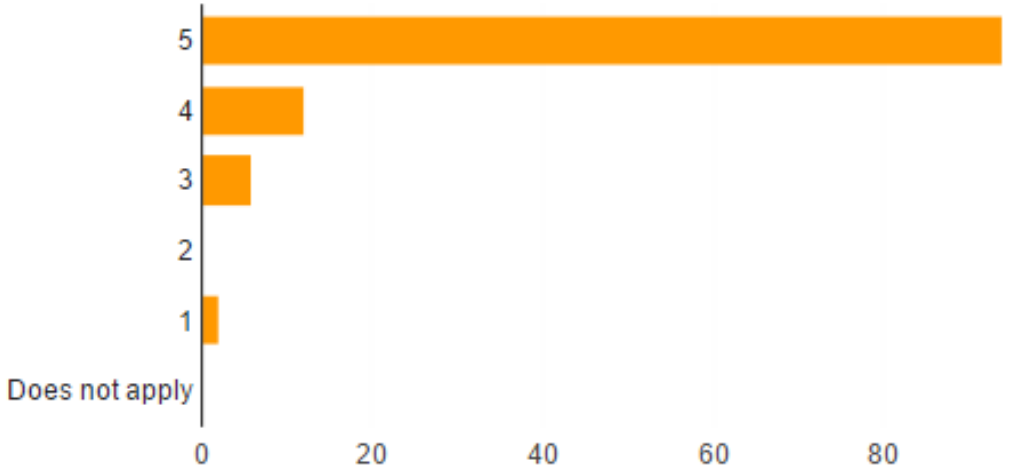
5	**99**	87.6%
4	**10**	8.8%
3	**0**	0%
2	**2**	1.8%
1	**2**	1.8%
Does not apply	**0**	0%

Video examples in assignments [Please rate the quality/usefulness of the course components. 5 = highest to 1 = lowest]



5	**106**	93%
4	**6**	5.3%
3	**1**	0.9%
2	**0**	0%
1	**1**	0.9%
Does not apply	**0**	0%

Online homework system [Please rate the quality/usefulness of the course components. 5 = highest to 1 = lowest]



5	**94**	82.5%
4	**12**	10.5%
3	**6**	5.3%
2	**0**	0%
1	**2**	1.8%
Does not apply	**0**	0%

Comments

“Taking online courses without having to buy a code have been very beneficial to me because most of the time i could not afford to buy a book with a code and i also found that the book was not even needed for most of the course but since i have been doing math on mathas, all i had to spend money on was the class itself and nothing additional and i feel like i have gotten more out of OER then the other courses before that and using this has been more efficient for me learning wise.

OER Calculus Versus Non OER Calculus Success Rates

Fall 2015

Brief/Business Calculus

OER: $\frac{48}{73} \approx 66\%$

(online: 43 f2f: 30)

Non OER $\frac{26}{43} \approx 60\%$

(f2f only)

Fall 2015

Calculus I

OER: $\frac{27}{40} \approx 68\%$

(online: 40)

Non OER $\frac{40}{90} \approx 44\%$

(f2f only)

OER Calculus Versus Non OER Calculus Success Rates

Spring 2016

Brief/Business Calculus

OER: $\frac{45}{70} \approx 64\%$

(online: 45 f2f: 25)

Non OER $\frac{25}{47} \approx 53\%$

(f2f only)

Spring 2016

Calculus I

OER: $\frac{17}{28} \approx 61\%$

(online: 28)

Non OER $\frac{73}{101} \approx 72\%$

(f2f only)

Spring 2016

Calculus II

OER: $\frac{22}{26} \approx 85\%$

(online: 26)

Non OER $\frac{13}{25} \approx 52\%$

(f2f only)

James, I stopped here but left some of the findings/results slides we have used in the past in case we want them

Findings in 2012-3

- 78.1% feel the open materials support adequately the work that they do outside of class
- 76.2% would recommend the open materials to their classmates
- Exams scores stayed about the same
- Survey Responses from students and faculty mostly positive
- More findings in “The Adoptions of Open Educational Resources by One Community College Math Department
  - *In* International Review of Research in Open and Distance Learning 14(4), August 2013

Quality of OER Materials

Questions about quality

- Collaborative effort – constant input and revisions
- Errors can be fixed immediately by faculty
- Can be tailored to individual classroom
- **I would argue they are of superior quality to publisher materials**

Thorns and Roses – A massive department OER effort

Thorns

- Huge amount of development time
- Maintenance and updates
- Distribution (bookstore!)
- Adjunct faculty buy-in

Roses

- Cost savings for students
- Department community building and support
- Energy of the new users
- Support of department and administration
- Introduction of creative teaching approaches

OER Implementation Advice

- Start small
- Grow slowly
- Identify faculty champions
- Involve everyone interested
- Gather administrative support
- Gather data, modify materials, continue to grow and learn and improve

Please describe what you like the **MOST** about the Maricopa Millions Project.

It has been great to have the opportunity **to share our great lab program with others in the district and beyond.**

The opportunity to create something unique and beneficial to our students. Also the opportunity to customize the course materials specifically for our needs.

The benefit to the student in the end and the focus on saving them money while producing a high quality OER course.

Collaboration & support (some money was nice, as well).

Lisa, Paul, and Rob were very accessible, positive, and encouraging. They were very proactive about meeting with us at certain points throughout the process.

Knowing the OER/Millions project is **helping students save money on textbook costs and lowering their overall cost of education**. Any such cost reduction can increase the likelihood students will continue their education.

Please describe what you like the **LEAST** about the Maricopa Millions Project.

Hard to find relevant materials at the appropriate reading level, spent lots and lots of time searching and deciding what to use and how to organize everything. Even though I liked this part the least, it was still productive.

It's not really a 'dislike' - **going through the OER process does require you to re-think and re-look at how content is developed and how students respond and learn.** That is a good thing but very time consuming!

The amount of work writing a text book is worth way more than we are paid.

The training was great but **finding resources that were OER for our specific course was a bit difficult.** Since OER is still relatively new this was an expected hurdle to overcome.

I believe that the whole issue of Americans with Disabilities Act considerations was the weak point. As instructors, we were given an overview, but there was **no process for formal way to go about ensuring our work met ADA requirements.** Discipline instructors are not experts in that kind of stuff, and in my experience there was not adequate support from the campus level.

Please describe how your **STUDENTS** have responded to your OER materials.

So far students are responding very positively to our materials. **They love the low cost.** :)

They love it. They appreciate not paying for a textbook and in my course, getting real time material from the web is a much more effective and relevant way to teach and learn.

Students love the OER format and really appreciate the cost savings. I encourage everyone to consider teaching through OER if at all possible.

They are actually using the book for a change and like it very much. Also like not having to buy a 200 dollar book.

They love free, especially when the school prints articles for them; **they liked not lugging around a textbook**; they liked interesting articles that they could relate to.

We are still piloting the textbook so all our feedback is not in yet **but so far students really like having the resources readily available and customized specifically for their course.**

It takes a village…..

Dr. Donna Gaudet

Professor Jennifer Bohart

Professor Paula Temple

Patricia Dueck

Dr. Ted Coe

Professor Dan Nearing

Dr. Phil Clark

Dr. April Strom

Dr. Judy Sutor

Professor Linda Knop

Paul Golisch

Hao Thai

Professor Roberto Ribas

And the list continues to grow…

Professor William Meacham

Professor Donna Guhse

Professor James Sousa

Professor Amy Volpe

Dr Lisa Young

Sian Proctor

Questions?

Dr Phillip G Clark – phil.clark@scottsdalecc.edu
James Sousa – james.sousa@phoenixcollege.edu