**Mathematics 10360 - Calculus B for the Life & Social Sciences**
Spring Semester 2025

**Text:** Calculus (4th Ed) - Early Transcendentals by Rogawski, Adams & Franzosa
**Publisher:** W. H. Freeman & Co.

| Section | Instructor | Class Schedule | **email**@nd.edu |
|---|---|---|---|
| 1 | Arthur Lim | MWF 9:25 - 10:15 DBRT 102 | arthurlim |
| 2 | Ryan Contreras | MWF 10:30 - 11:20 PCTR 114 | rcontre2 |
| 3 | Stephan Stolz | MWF 11:30 - 12:20 DBRT 126 | stolz.1 |
| 4 | Audriana Houtz | MWF 12:50 - 1:40 HAYE 129 | apohlma2 |
| 5 | Xianglong Ni | MWF 2:00 - 2:50 HAYE 117 | xni3 |

| Section | Teaching Assistant | Class Schedule | **email**@nd.edu |
|---|---|---|---|
| 11 | Gavin Dooley | R 9:30 - 10:20 DBRT 120 | gdooley2 |
| 12 | Gavin Dooley | R 11:00 - 11:50 DBRT 320 | gdooley2 |
| 21 | Gavin Dooley | R 12:30 - 1:20 DBRT 318 | gdooley2 |
| 22 | Joshua Lehman | R 2:00 - 2:50 DBRT 312 | jlehman4 |
| 31 | Joshua Lehman | R 3:30 - 4:20 JORDAN 322 | jlehman4 |
| 32 | Harrison Gimenez | R 5:05 - 5:55 OSHA 106 | hgimenez |
| 33 | Clara Huggins | R 9:30 - 10:20 DBRT 206 | chuggins |
| 41 | Clara Huggins | R 11:00 - 11:50 NIEU 184 | chuggins |
| 42 | Joshua Lehman | R 12:30 - 1:20 DBRT 319 | jlehman4 |
| 51 | Harrison Gimenez | R 2:00 - 2:50 DBRT 313 | hgimenez |
| 52 | Chen-Kuan Lee | R 3:30 - 4:20 DBRT 213 | clee36 |
| 53 | Chen-Kuan Lee | R 5:05 - 5:55 OSHA 107 | clee36 |

**Course Website:** https://www3.nd.edu/∼m10360/
Most information for this course is posted on its website. These include instructors and TAs office hours and contact information, daily homework information, exam dates and venues, practice exams, and etc.

**Calculator Policy:** Calculators are **NOT** allowed on any of the quizzes or exams. You may use your calculators for homework and assignments, but it is strongly recommended that you do not rely on any of the graphing functions on the calculator.

**Course Grade & Breakdown**

| | Date | Time | Room | Points |
|---|---|---|---|---|
| Gateway Quiz | During tutorial for week 02 (10 pts), week 03 (15 pts), & week 04 (25 pts) | | | 50 |
| Midterm Test 01 | Tues Feb 18 | 8:00am - 9:15am | See website | 100 |
| Midterm Test 02 | Tues Mar 25 | 8:00am - 9:15am | See website | 100 |
| Midterm Test 03 | Thurs Apr 24 | 8:00am - 9:15am | See website | 100 |
| Final Exam | Wed May 07 | 8:00am - 10:00am | See website | 150 |
| Online Hwk & Assignments | Submit online hwk as scheduled on Mobius. | | | 75 |
| Participation | participation, attendance, activities & quizzes | | | 25 |
| | | | **Total points:** | 600 |

Your final grade will be based on your total score out of 600. All course activities are in-person except otherwise stated. Please note that course format and policies are subjected to change as we navigate the current pandemic situation.

**Drop Policies:** Each homework assignment will be graded out of 25 points. At the end of the semester **THREE** sets of homework of the lowest scores will be dropped. Homework would still count toward 12.5% of your grade.

**Weighted Midterms:** There are three midterm tests each worth 100 points. At the **end of the semester**, we will re-weight the three midterm scores so that lowest scores earns up to 25% of the 300 points, the middle scores earns up to 35% of the 300 points and the highest scores earns up to 40% of the 300 points. The sum of the weighted scores gives you your midterm total out of 300 points.

There are three midterm tests each worth 100 points, Gateway quiz01 (10 pts) , Gateway quiz02 (15 pts) , Gateway quiz03 (25 pts), and final exam worth 150 points.

**Missed exams or quizzes:** A student who misses an examination or quiz will receive **zero points** for that exam or quiz. If you have a valid excuse (illness, excused athletic absence, etc.) for missing an exam, please contact your section professor ASAP (preferably before the exam) to schedule a makeup exam. If you missed any tutorial work or quizzes, you must contact your TA immediately too.

**Honor Code:** Examinations, homework, assignment and quizzes are conducted under the honor code. While collaboration in small groups in doing homework is permitted (and strongly encouraged) in this course, copying is not. In particular, **copying from the Student Solutions Manual is a violation** of the Honor Code. Exams are closed book and are to be done completely by yourself with no help from others.

**Homework & Assignments:** Online Homework and assignment problems are assigned daily. Their schedule is listed on the course website. We do not accept any late homework or assignment unless you have a documented medical or university excuse. Exceptions are handled case by case. You are encouraged to work on these problems in groups, but all online homework and assignments must be turned in individually. Remember that you **will not learn anything by simply copying another student's work or the Student Solutions Manual**. The main purpose of homework and assignments is to help you learn the material and assess yourself. Experience shows that students who take their homework seriously do very well in the course because they have a better understanding of the material. For detailed homework and assignment instructions, please see attached information.

**Class Attendance:** A student who accumulates more than 3 unexcused absences may be given an F grade.

**Classroom Policies:** Please do your best to show up on time and quietly enter the room if you are late. Please remember to respect your peers who are here to learn. Indeed, class disruptions will **not** be tolerated and offending parties will be asked to leave. During lectures you are encouraged to actively participate by answering and asking questions.

**Study Tips** are attached and also posted on the on the course website (http://www.nd.edu/∼m10360). Please review it. The key point is to start early and be consistent.

**Getting Help:** You can get help for mastering the course material from the avenues below. More information can be obtained from the 10360 course website; click on "TUTORING & HELP" or go directly to

https://www3.nd.edu/∼m10360/tutor_help.html.

It is important that you get help soon when you have difficulty with the course. The earlier you meet with your instructor and TA, the more we can do to help and advise.

• **Instructor & TA's Office Hours** - We highly encourage students to visit their professors/TAs when they have questions. Students can attend any office hours available, not just those of their section professors. See office hour schedule here: https://www3.nd.edu/∼m10360/instructors.html

• **Calculus B Tutoring Sessions:** These are walk-in tutoring sessions that runs Sunday through Wednesday. See schedule posted here: https://www3.nd.edu/∼m10360/instructors.html

• **Mathematics Help Room:** The help room information is posted here:

https://math.nd.edu/undergraduate/student-resources/math-help-rooms/

• **Learning Resources Center (LRC) Help**

Please note that instructors and tutors are **NOT** there to do your homework. In fact, tutors are instructed to guide you to the answer and not do your homework. Please do not ask the tutors to grade your homework, and be specific about what you want to discuss. You can find more information here:

https://firstyear.nd.edu/resources/academic-support/learning-resource-center/

## MATH 10360 Course Work Policy

There are both online homework and paper-pencil assignments for this course.

**Written Assignments** are due in class according to the schedule posted on the Math 10360 website. The questions and problems to be turned in are posted on the course website. You are expected to submit your written assignment in the following manner:

- Write your name clearly on your homework.
- Your work has to be clearly and logically written, showing the method of solution, not just a final answer.
- Any work falling short of the above expectations may not be graded.

We do not accept any late homework or assignment unless you have a documented medical or university excuse. Exceptions are handled case by case. If you need to attend a school related event, you may turn in your assignment early or arrange to have your peer turn it in on the day it is due.

**Online Homework** is assigned daily and is due as scheduled on the course calendar:

https://www3.nd.edu/~m10360/homework.html

The online systems we are using is Mobius.

- Mobius is accessed through the ND canvas system.
- The ND e-mail address will be used to make all course related announcements. You must check your e-mail regularly daily.

All online homework should be done using paper and pencil, and be treated the same manner as written assignments. We encourage you to keep a record of your work for material submitted online; these are helpful when you review for an exam. Usually, you are expected to **complete about 5 to 8** problems of your online homework assigned at the end of each class day. If you have difficulty solving the homework questions please see your TA/professor or visit the listed the math help resources above.

Absolutely no late homework will be accepted. You only need the course textbook and Mobius for this course.

Access Mobius at:

http://canvas.nd.edu/

All homework and assignment will be weighted the same. The three homework/assignment lowest of scores will be dropped at the end of the semester.

Online Homework Submission Policies. All submission due dates for online homework on Mobius are fixed. You are highly encouraged to SUBMIT your homework well ahead of deadlines. We DO NOT accept excuses like: "My computer/Webservers shut down just before I could submit my work on time". Save your answers as you enter them online. This ensures that no work is lost BEFORE the submission deadline. Enough "buffer" time is given to ensure timely submission of your work. All online homework are due are due at 11:59pm at the end of the next class day unless otherwise stated. Exact due dates of online homework are posted on Mobius. In addition, after the deadline of a homework, you can complete a late homework to obtain up to 80% of the full score. Due dates for late copies of homework are also posted on Mobius. We do not encourage late online homework but understand there are times where a break is needed. Please note your scores for any set of homework is the maximum scores of all your attempts for both that set of homework and the corresponding late copy. This means doing problems in the late homework copies as practice will NOT lower your score.

Very occasionally there may be needed adjustments to homework. These are announced through course emails and you are responsible in checking and reading emails daily.

**Access for Calculus B online Homework system Mobius Assessments**

The online homework system Mobius is accessed through Canvas. Follow the steps below to logged into Mobius

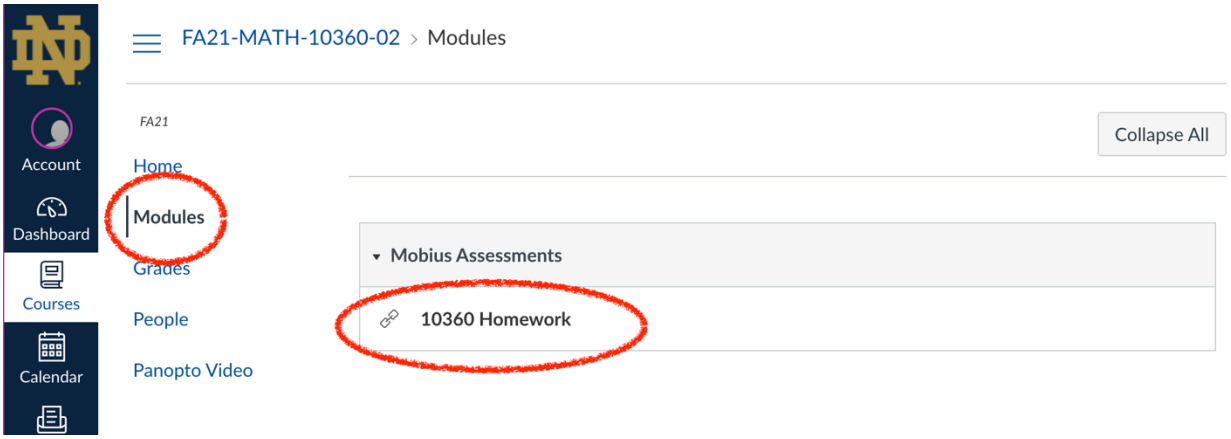
(a) Access Canvas through InsideND by searching for the Canvas App or using the link:

https://canvas.nd.edu/

(b) Log into Canvas using your NetID and password.

(c) Find your Canvas Calc B section using the navigation bar on the left.

(d) In your Calc B section, click on "Module". You will see the link to 10360 Homework in the Mobius Assessment module. See figure below.




(e) Click on the "10360 Homework" link and launch Mobius.

(f) Mobius will launch in a new tap.

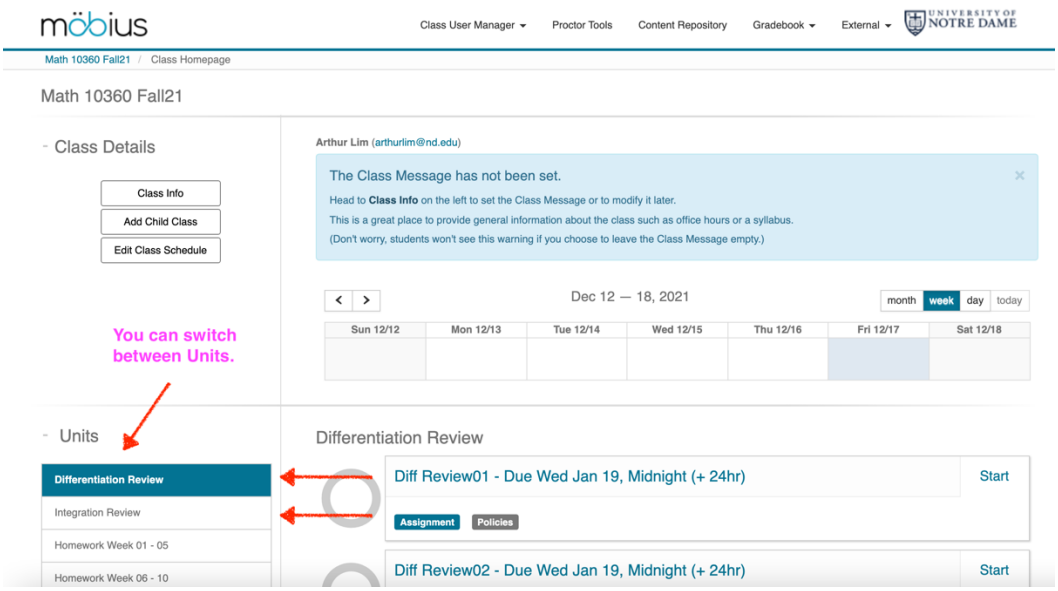
(g) There are three units of homework available. You can toggle between the units to see the sets of homework available. See figure below.

Differentiation Review – Three sets and 25 points each.

Integration Review – Two sets and 25 points each.

Gateway Prep – Three sets and 25 points each.

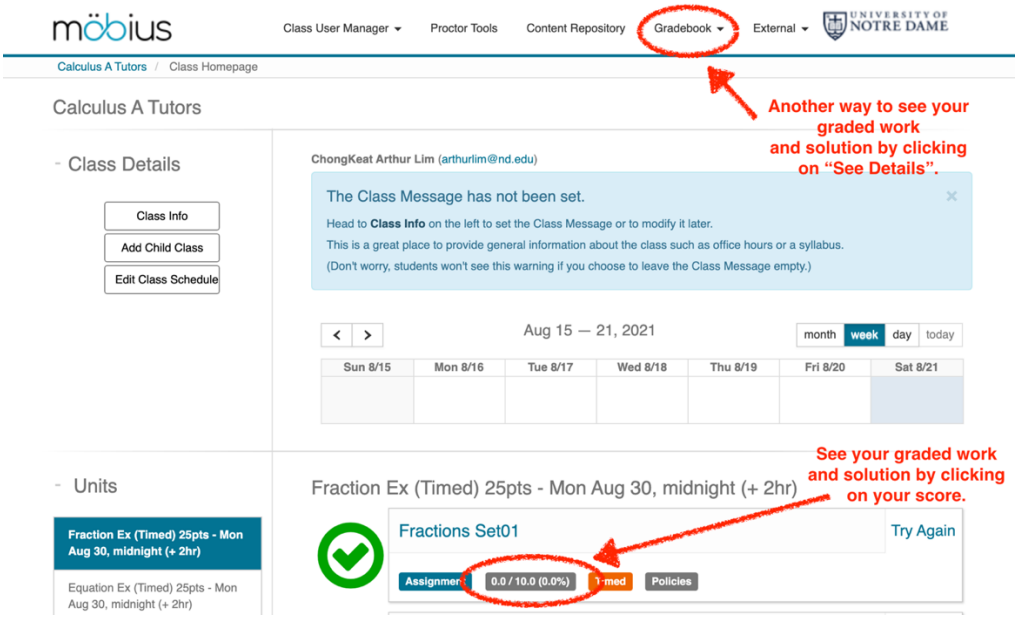
You have eight attempts till all questions are correct. Correct answers of previous attempts are saved for exercises with no time limit.




The due dates are as stated on title of each homework set. We are using the due date to pace your learning so please schedule time to keep the due dates.

After you submitted a set of homework, you can see details of the graded work by clicking on the score or see details in the gradebook in Mobius. See an illustrative figure below. Explore the links.

Learn from your mistakes in the provided solution. Understand the rules applied and process of solution but DO NOT just follow a “cook book” process or mere pattern recognition. Every step of the solution has a reason.



# Math 10360 (Calculus B) Syllabus

Text: Calculus (Early Transcendentals) 4TH Edition
J. Rogawski, C. Adams & R. Franzosa

| | |
|---|---|
| 3.8 | Derivatives of Inverse Functions |
| 5.7 | Further Transcendental Functions |
| 9.1 | Application of Exponential Functions - Exponential Growth and Decay |
| 6.1 | Area Between Two Curves |
| 6.2 | Setting Up Integrals: Volumes, Density, Average Value |
| 6.3 | Volumes of Revolution: Disks and Washers |
| 6.4 | Volumes of Revolution: Cylindrical Shells |
| 6.5 | Work and Energy |
| 7.1 | Integration by Parts |
| 7.2 | Trigonometric Integrals |
| 7.3 | Trigonometric Substitution |
| 7.5 | The Method of Partial Fractions |
| 7.7 | Improper Integrals |
| 7.8 | Numerical Integration |
| 14.1 | Functions of Two or More Variables |
| 15.1 | Integration in Two Variables |
| 15.2 | Double Integrals over More General Region |
| 11.3 | Polar Coordinates |
| 15.4 | Double Integration in Polar Coordinates (Only) |
| 9.1 | Solving Differential Equations |
| 9.2 | Models Involving $y' = k(y-b)$ |
| 9.3 | Graphical and Numerical Methods |
| 9.4 | The Logistic Equation (including SI compartmental disease model) |
| 9.5 | First-order Linear Equations (including mixing tank) |
| 14.3 | Partial Derivatives (including estimation from data points for functions) |
| 14.6 | Multivariable Calculus Chain Rule (Appln to Elasticity/Sensitivity) |
| 14.8 | Lagrange Multipliers: Optimizing with a Constraint |
| Notes | Geometric Sequences and Geometric Series (Appln to Medicine and Ecology) |
| 10.1 | Sequences |
| 10.2 | Summing an Infinite Series |
| 10.5 | The Ratio Test (no root test) |
| 10.6 | Power Series (Application of Ratio Test) |
| 10.7 | Taylor Polynomial |
| 10.8 | Taylor Series |

# Basic Algebra Rules

**Exponential Rules:**

$a^m \cdot a^n = a^{m+n}$ $\qquad$ $(ab)^m = a^m b^m$ $\qquad$ $\dfrac{a^m}{a^n} = a^{m-n}; \quad a \neq 0$

$a^0 = 1 \quad a \neq 0$ $\qquad$ $a^{1/m} = \sqrt[m]{a}$ $\qquad$ $\left(\dfrac{a}{b}\right)^m = \dfrac{a^m}{b^m}; \quad b \neq 0$

$(a^m)^n = a^{mn}$

**Distribution Law:**

$a(b + c) = ab + ac$ $\qquad$ $\dfrac{a + b}{c} = \dfrac{a}{c} + \dfrac{b}{c}$ $\qquad$ $\dfrac{a - b}{c} = \dfrac{a}{c} - \dfrac{b}{c}$

**Quadratic Factoring:**

$(a + b)^2 = a^2 + 2ab + b^2$ $\qquad$ $(a - b)^2 = a^2 - 2ab + b^2$

$a^2 - b^2 = (a - b)(a + b)$

**Properties of Logarithm:**

$\log_a(MN) = \log_a M + \log_a N$ $\qquad$ $\log_a\left(\dfrac{M}{N}\right) = \log_a M - \log_a N$ $\qquad$ $\log_a(M)^t = t \log_a M$

$\log_a a = 1$ $\qquad$ $\log_a 1 = 0$

$\log_a a^x = x$ $\qquad$ $a^{\log_a x} = x$

Change of Base: $\qquad \log_a M = \dfrac{\log_b M}{\log_b a}$

$\ln(MN) = \ln M + \ln N$ $\qquad$ $\ln\left(\dfrac{M}{N}\right) = \ln M - \ln N$ $\qquad$ $\ln(M)^t = t \ln M$

$\ln e = 1$ $\qquad$ $\ln 1 = 0$

$\ln e^x = x$ $\qquad$ $e^{\ln x} = x$

**Math 10360 – Example Set 01A**
**Derivative and Integration Review**

**Basic Properties of Derivatives:**

$[f(x) + g(x)]' \stackrel{?}{=}$

$[f(x) - g(x)]' \stackrel{?}{=}$

$[c \cdot f(x)]' \stackrel{?}{=}$

**Product/Quotient/Chain Rule.** Let $f(x)$ and $g(x)$ be differentiable functions. Derive formulas for the derivatives of $p(x) = f(x) \cdot g(x)$ and $q(x) = \dfrac{f(x)}{g(x)}$.

**Product Rule:**

$\dfrac{d}{dx}(f(x)g(x)) = (f(x)g(x))' =$

**Chain Rule:**

$\dfrac{d}{dx}\left(f(g(x))\right) = [f(g(x))]' =$

**Quotient Rule:** $\dfrac{d}{dx}\left(\dfrac{f(x)}{g(x)}\right) = \left(\dfrac{f(x)}{g(x)}\right)' =$

**Some Common Derivatives.** For any numbers $k$ and $n$:

$\dfrac{d}{dx}(k) \stackrel{?}{=}$

$\dfrac{d}{dx}(x^n) \stackrel{?}{=}$ (Power Rule)

$\dfrac{d}{dx}(\sin(x)) \stackrel{?}{=}$

$\dfrac{d}{dx}(\cos(x)) \stackrel{?}{=}$

$\dfrac{d}{dx}(\tan(x)) \stackrel{?}{=}$

$\dfrac{d}{dx}(\csc(x)) \stackrel{?}{=}$

$\dfrac{d}{dx}(\sec(x)) \stackrel{?}{=}$

$\dfrac{d}{dx}(\cot(x)) \stackrel{?}{=}$

**1.** Find the following derivatives

**a.** $\dfrac{d}{dx}(x^3 \tan(x)) \stackrel{?}{=}$

**b.** $\dfrac{d}{dx}\left(\sqrt[3]{2x^2 - 5x + 3}\right) \stackrel{?}{=}$

**2.** Find the equation of the tangent line to the curve $x\cos(1+2y) = 2y^2 - 8$ at the point $(0, 2)$.

$\left(\text{Check } \frac{dy}{dx} = \frac{\cos(1+2y)}{4y+2x\sin(1+2y)}\right)$

**Basic Integrals.** For any numbers $k$ and $n$:

$\displaystyle\int x^n\,dx \stackrel{?}{=}$ (Power Rule)

$\displaystyle\int \sin(x)\,dx \stackrel{?}{=}$ $\displaystyle\int \cos(x)\,dx \stackrel{?}{=}$

$\displaystyle\int \sec^2(x)\,dx \stackrel{?}{=}$ $\displaystyle\int \csc^2(x)\,dx \stackrel{?}{=}$

$\displaystyle\int \csc(x)\cot(x)\,dx \stackrel{?}{=}$ $\displaystyle\int \sec(x)\tan(x)\,dx \stackrel{?}{=}$

**Method of Substitution**

**3.** Find a formula for the function $f(x)$ if its slope is given by the $x\sin(x^2+1)$ and the graph of $f(x)$ passes through the point $(1,2)$.

**4.** Evaluate $\displaystyle\int_0^1 \frac{x^2+2}{\sqrt{x^3+6x+5}}\,dx.$

**Math 10360 – Example Set 01B**
**Derivative of Exponential & Logarithmic Functions: Section 3.9**

**1.** Consider the area function $f(x) = \displaystyle\int_1^x \frac{1}{t}\,dt$ for $x > 0$. We call $f(x)$ the logarithm function and denote it by $f(x) = \ln x$.

**a.** $f'(x) = \dfrac{d}{dx}[\ln x] = \dfrac{d}{dx}\left[\displaystyle\int_1^x \frac{1}{t}\,dt\right] \stackrel{?}{=}$ _____ $(x > 0)$

**b.** $\dfrac{d}{dx}[\ln|x|] \stackrel{?}{=}$ _____ $(x \neq 0)$

**c.** What can you say about $\ln(1)$? Define the value of $e$ using the definition of the natural logarithm.

**d.** Using the Fundamental Theorem of Calculus, show that $\ln(ax) = \ln(a) + \ln(x)$. Prove further that (i) $\ln(e^n) = n$ where $n$ is an integer and (ii) $\ln(e^r) = r$ where $r$ us any rational number.

**Example A.** Find the area under the graph of $y = \dfrac{-2}{4x-3}$ for $0 \leq x \leq 1/2$.

**e.** Give a sketch of the graph of $y = \ln x$. State clearly the domain and range of $\ln x$. What are the values of $\lim\limits_{x\to 0^+} \ln x$ and $\lim\limits_{x\to\infty} \ln x$?

**f.** The inverse $g(x)$ of $f(x) = \ln x$ exists. Why? Sketch the graph of $g(x) = \exp(x)$. Infer from (d) that we may write $\exp(x) = e^x$ for all real value $x$.

**g.** Explain why we may write: (i) $\ln(e^x) = x$ for all $x$, and $e^{\ln y} = y$ for $y > 0$.

**h.** Using the fact that $\dfrac{d}{dx}(e^x) = e^x$, the chain rule and the fact that $e^{\ln b} = b$ $(b > 0)$, show that $\dfrac{d}{dx}(b^x) = b^x \ln b$.

**i.** Using the change of base formula $\log_b x = \dfrac{\ln x}{\ln b}$, show that $\dfrac{d}{dx}(\log_b x) = \dfrac{1}{x \ln b}$.

**Example B.** Find the equation of the tangent line to the curve $y = 4 - 2e^x + \ln\left(\dfrac{1-x^2}{1+x^2}\right)$ at $x = 0$.

**Review Exercise.** Complete the following formulas:

### Logarithmic Properties

$\ln(ab) \stackrel{?}{=}$

$\ln(a^n) \stackrel{?}{=}$

$\ln\left(\frac{a}{b}\right) \stackrel{?}{=}$

$\ln(e) \stackrel{?}{=}$

$\ln 1 \stackrel{?}{=}$

$\ln(e^x) \stackrel{?}{=}$

$e^{\ln x} \stackrel{?}{=}$

### Exponential Rules

$a^n \cdot a^m \stackrel{?}{=}$

$\frac{a^n}{a^m} \stackrel{?}{=}$

$a^n \cdot b^n \stackrel{?}{=}$

$\frac{a^n}{b^n} \stackrel{?}{=}$

### Derivative and Anti-derivative Rules

$\frac{d}{dx}(\ln x) \stackrel{?}{=}$

$\frac{d}{dx}(e^x) \stackrel{?}{=}$

$\frac{d}{dx}(\log_b x) \stackrel{?}{=}$

$\frac{d}{dx}(b^x) \stackrel{?}{=}$

$\int \frac{1}{x}\,dx \stackrel{?}{=}$

$\int e^x\,dx \stackrel{?}{=}$

$\int b^x\,dx \stackrel{?}{=}$

**Math 10360 – Example Set 01C**
**Derivative of Exponential & Logarithmic Functions: Section 3.9**
**Derivative of Inverse Trig Function: Section 5.8**

**1.** By restricting the domain of $\sin x$, $\cos x$, and $\tan x$ define their inverse functions ($\arcsin x$, $\arccos x$, and $\arctan x$). Sketch the graph of each of the inverse functions stating their range and domain.

**2.** Using chain rule, obtain the derivative of $\arcsin(x)$, $\arccos(x)$, and $\arctan(x)$.

**Key Formulas:**

$\frac{d}{dx}(\arcsin x) \stackrel{?}{=}$ $\frac{d}{dx}(\arccos x) \stackrel{?}{=}$ $\frac{d}{dx}(\arctan x) \stackrel{?}{=}$

$\int \frac{1}{\sqrt{1-x^2}}\,dx \stackrel{?}{=}$ $\int \frac{1}{1+x^2}\,dx \stackrel{?}{=}$

**3.** Using the log function, find the derivative of $y = (1+2x)^{\arctan x}$.

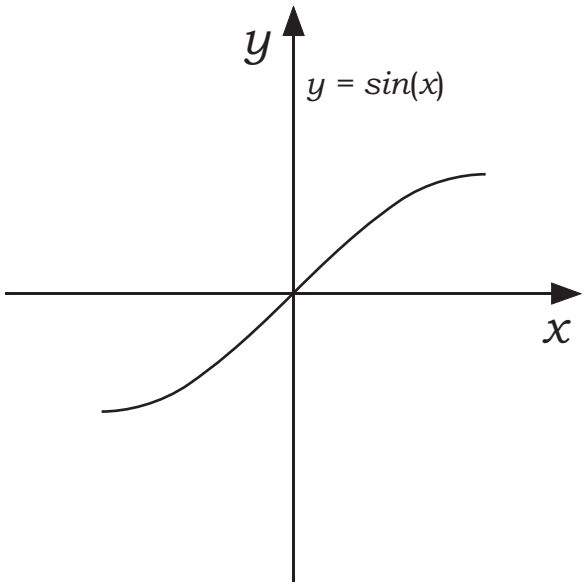
**4a.** Find the derivative of $\arcsin(2x+y^2)$ with respect to $x$ treating $y$ as a constant.

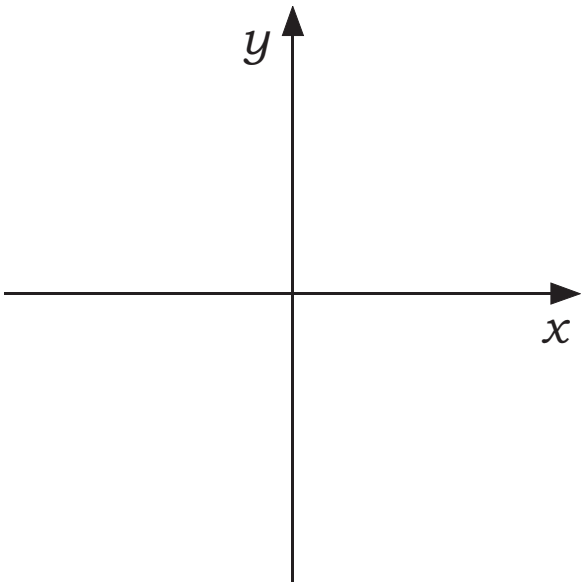
**4b.** Find the derivative of $\arcsin(2x+y^2)$ with respect to $y$ treating $x$ as a constant.

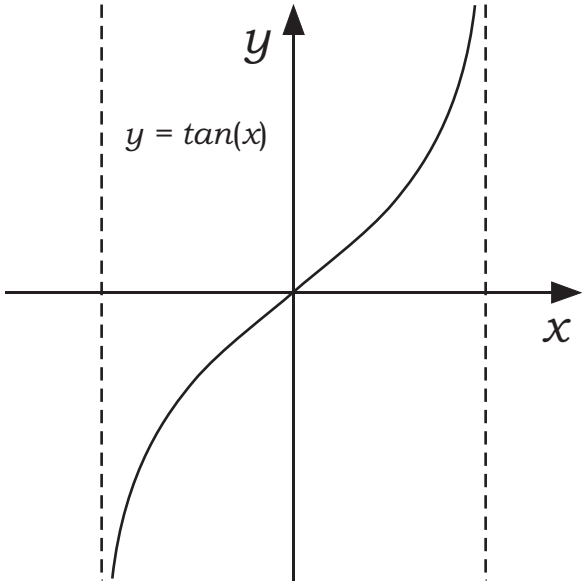
**5.** A population $y(t)$ (in units of millions) of bacteria grows according to the rate $\frac{dy}{dt} = \frac{1}{1+4t^2}$. Find the total change in the size of the population over the time duration $0 \le t \le 1/2$.

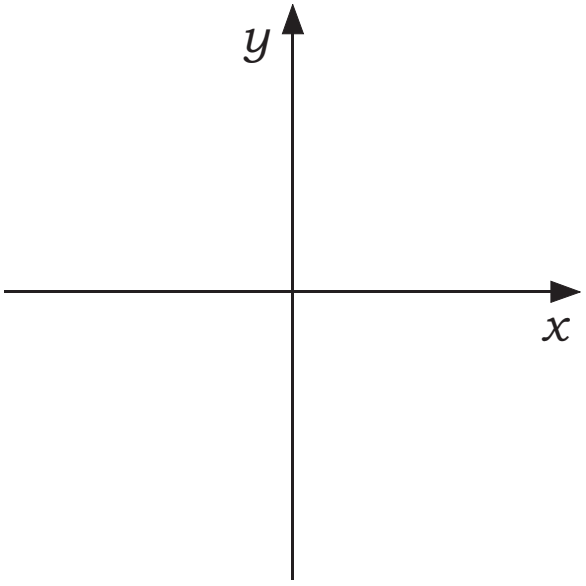
**6.** (Review) Without using a calculator, find the value of each of the following expressions:

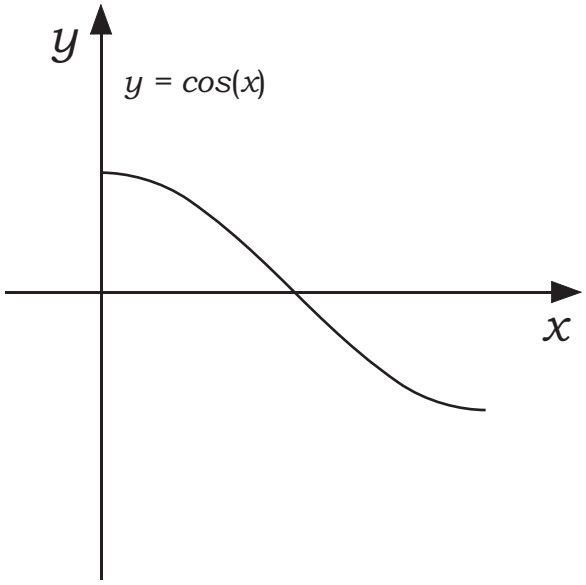
**a.** $\arcsin(\sqrt{3}/2)$ **b.** $\arcsin(-\sqrt{3}/2)$ **c.** $\arccos(0.5)$ **d.** $\arctan(-1)$

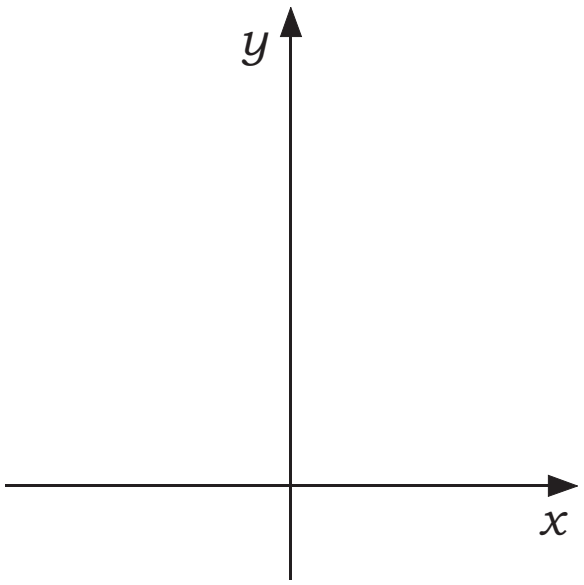

y
y = sin(x)
x


y
x


y
y = tan(x)
x


y
x


y
y = cos(x)
x


y
x

## Suggestions and Tips for Success in Calculus B

*By failing to prepare,
you are preparing to fail.*
~ Benjamin Franklin

**Learning mathematics takes consistent practice.** Many of the opportunities for practice are furnished by the homework and assignment problems that you need to turn in regularly. In addition to homework problems, you should also honestly "test" yourself with extra problems in the textbook, and exam reviews. Your performance in these "self-tests" could give you a good gauge of your understanding of the material taught in class.

**Aim** to achieve ownership of mathematical knowledge.

By that we mean you could:

(1) Identify the tools needed to solve a given problem.

(2) Carry out the process of solution in a reasonable time frame without help from a tutor or peer.

(3) Give a reason for each step in the solution of the problem.

(4) Obtain insights from your computation besides giving a number.

Although we recognize that some individuals are more gifted in mathematics, **consistency in your learning is still required to improve your chance of success**. Mathematics is a hard subject; for many, much has to be done just to get by. However, the skills you gain and the opportunities opened to you from your training in the subject will make the challenges you face worthwhile. These skills are required in your future employment. For instance, see:

BusinessWeek: Math Will Rock Your World (Jan 23, 2006)

http://news.bbc.co.uk/2/hi/uk_news/education/6954666.stm

**Meet** with your instructors (professor and TA) whenever you feel that you are falling behind or have trouble understanding the material to the level listed above. In addition to your instructors, you could also get help from Math department tutoring, and the LRC. For details look up:

http://www.nd.edu/~m10360/tutor_help.html

Ultimately, students need to be able to solve the problems by themselves. But you will be helped by the guided experience provided by the course. Use the resources available to you to support your learning. These resources include your instructor, tutoring services, and practice problems.

Many students in the past have been successful in Calculus.

With that said, we wish to give advice on how you should manage your time, and tips for handling various learning activities of the course, including the examinations.

Getting the Most of Classroom Instruction
**Be in class** and be prepared to listen attentively and take notes.

**Work out** all examples discussed in class. You should be able to work these out on your own in a reasonable time frame. Most problems should take no more than 20 minutes if you have grasped the material. You should be able to reason out and explain each step of your work.

**Identify** the material that you do not understand, and examples that you have a hard time working out or take a long time to complete.

**Ask for help** immediately. We highly encourage that you clarify any confusion with your instructors before the next class or at least on the same day as the next class. The point is to **promptly resolve any confusion as soon as possible**. You may still need to "test" yourself with a few similar problems after meeting with your instructor.

Completing Your Homework/Assignments

Almost all homework is online. You may have occasional written assignments. Here are some good practices for completing your homework.

**Start** early to give a good margin of time for completing your assignment. Aim to complete 5 to 8 problems of the assigned homework at the end of each class day. Homework is posted online on Mobius which can be accessed through Canvas. Written homework will also be posted on Canvas.

**Mark** out those you have confidence doing and those you do not know how to start. Work on at least a couple of them to know how much help you need. Usually, you are expected to complete or at least seriously attempt all problems of your written assignment assigned at the end of each class day.

**Attempt** those problems that you are confident in completing first. Work on those that you are unsure of. Give yourself a full 20 minutes to seriously attempt these problems.

**Ask for help** promptly if you still cannot do your assignments. Bring along your scratch work.

**File** your assignment immediately when it is returned. You will need it for reviewing.

You should have a notebook that organizes your work for each online homework. Work out the questions just like you would a paper and pencil homework and **keep your work for review later as part of your exam preparation.**

**Do not wait till the last minute to complete and submit your work online.**

Preparing for Exams

**Give yourself a week** to prepare for each midterm (or final) exam. Get all the material you need to go through: (1) Sample exams, (2) Class notes, (3) Homework, and (4) Tutorial material.

There is obviously a lot of material to be covered. However, **learning the course material should be a consistently on-going process** and should NOT take place merely the week before the exam.

**Start with the sample exam.** Mark out all the problems that you are confident of solving, those for which you need to refresh your memory, and those you totally do not know how to attack.

**Attempt** as many problems as possible before review sessions.

**Ask for help** promptly from tutors and instructors. Bring along your attempts and scratch work; they help us see how to best facilitate your learning.

**Attend** review sessions. Please note that going to the review session alone does not mean that you are ready for the test.

**Test yourself** with an exam from a previous year. You need to be able to solve a problem by reasoning out each step of the solution.

**Look for more** practice problems in topics that you are still unsure of.