

MA 16100 FALL 2022

DR. HOOD

WARM UP - LEC 100

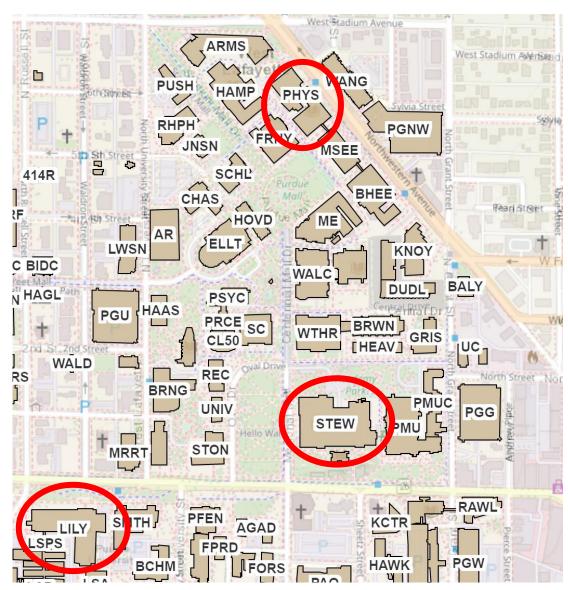
Which question from the Final Exam on Fall 2018 (Questions 1-13) do you most want to see?

- 1) Domain
- 2) Functions + Fractions
- 3) Asymptotes
- 4) Limits
- 5) Velocity + Acceleration
- 6) Limits
- 7) Limits (L'Hoptial's Rule)

- 8) L'Hopital's Rule
- 9) Half Life
- 10) Quotient Rule
- 11) Logarithms
- 12) Deriv of Inverse Trig Fcns
- 13) Chain Rule

1. WHEN/WHERE IS FINAL?

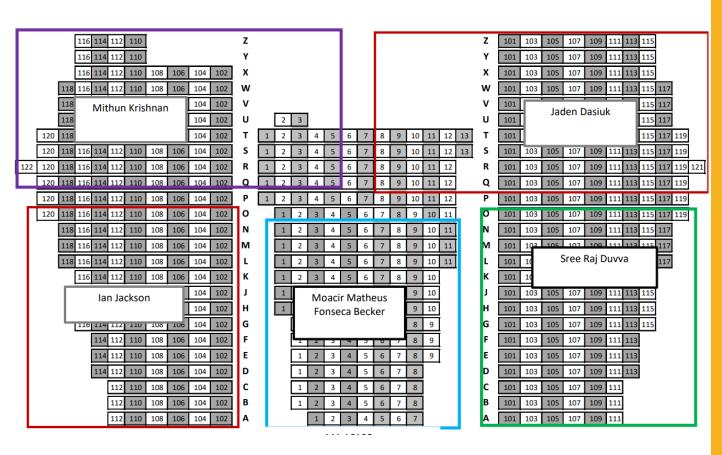
- Tuesday Dec 13
- 8:00-10:00am
- We will be in multiple rooms for this Exam
 - -STEW
 - -LILY
 - -PHYS



Loeb Playhouse (STEW 183)

Main Floor

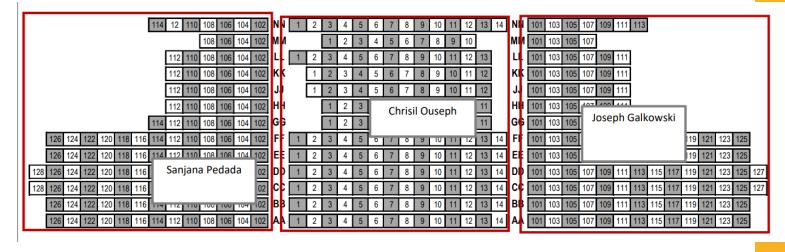
- Grouped by TA:
 - -Mithun Krishnan
 - -lan Jackson
 - -Moacir Becker
 - -Sree Duvva
 - -Jaden Dasiuk



Loeb Playhouse (STEW 183)

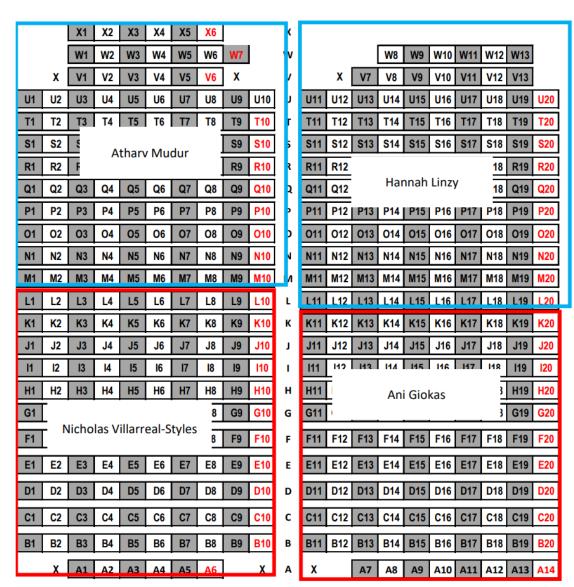
Balcony

- Grouped by TA:
 - -Sanjana Pedada
 - -Chrisil Ouseph
 - –Joseph Galkowski



LILY 1105

- Grouped by TA:
 - -Athary Mudur
 - Hannah Linzy
 - Nicholas Villareal-Styles
 - Annie Giokas



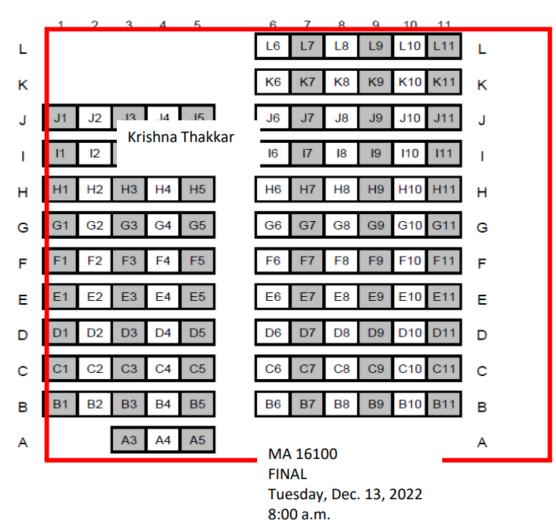
PHYS 114

- Grouped by TA:
 - -Tyler Dunaisky and Alex Hsu

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L1	L2	L3	L4	L5	L	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L16	L	L17	L18	L19	L20	L21
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	Tyler Dunaisky F6						F7	F8	F9	F10	F11	F12	F13	Π						F19	F20	F21
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B1	B2	В3	B4	B5	В	В6	В7	B8	В9	B10	B11	B12	B13	B14	B15	B16	В	B17	B18	B19	B20	B21
	A2	A3	A4	A5	Α	A6	Α7	A8	Α9	A10	A11	A12	A13	A14	A15	A16	Α	A17	A18	A19	A20	

PHYS 223

- Grouped by TA:
 - -Krishna Thakkar



8:00 a.m.

PH' PHYS 223

2. ASSIGNED SEATS

Students will be assigned seats.

(posted next week)

Your room and assigned seat will be posted in the Brightspace Gradebook.





Fall 2022 MA 16100 - LEC 100 - ...











3. WHAT IS THE EXAM FORMAT?

- Face-to-face and multiple-choice
- 25 Questions worth 4 points each
 - Total = 25 x 4 = 100
- Question order will be random

3. WHAT IS ON THE EXAMP

- Final Exam is cumulative (covers Lessons 0 35)
- Approximate distribution of questions:

Topics from Exam 1	Topics from Exam 2	Topics from Exam 3	Topics on New Material
Lessons 0 – 10	Lessons 11 – 19	Lessons 20 – 30	Lessons 31 – 35
6 Questions	6 Questions	6 Questions	5-6 Questions

* Plus 1-2 Questions chosen randomly

4. WHAT CAN I USE ON THE EXAMP

Notes, books, calculators, and electronic devices are not permitted.

Please bring to the exam:	Put away (and turn off) all:
Number 2 pencil	Notes
PUID	Textbook
Your REC section number	Calculator
Your TA's name	Other electronic devices

Scantron

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Exam Booklet

MA 16100 EXAM 2 - 10/18/2022 TEST/QUIZ NUMBER:

88

NAME	YOUR TA'S NAME
STUDENT ID #	RECITATION TIME

You must use a #2 pencil on the scantron answer sheet. Fill in the following on your scantron and blacken the bubbles

- 1. Your name. If there aren't enough space for your name, fill in as much as you can.
- Section number with a leading zero, e.g. 0302. (If you don't know your section number, ask your TA.)
- 3. Test/Quiz number: 88
- 4. Student Identification Number: This is your Purdue ID number with two leading zeros
- Blacken in your choice of the correct answer on the scantron answer sheet for questions 1–12.

There are 12 questions, each worth 8 points (you will earn 4 points for filling out your scantron correctly). Do all your work in this exam booklet. Use the back of the test pages for scrap paper. Turn in both the scantron and the exam booklet when you are finished.

If you finish the exam before 7:20, you may leave the room after turning in the scantron sheet and the exam booklet. You may not leave the room before 6:50. If you don't finish before 7:20, you MUST REMAIN SEATED until your TA comes and collects your scantron sheet and your exam booklet.

EXAM POLICIES

- Students may not open the exam booklet until instructed to do so.
- Students must obey the orders and requests by all proctors, TAs, and lecturers.
- No student may leave in the first 20 min or in the last 10 min of the exam.
- 4. Books, notes, calculators, or any electronic devices are not allowed on the exam, and they should not even be in sight in the exam room. Students may not look at anybody else's test, and may not communicate with anybody else except, if they have a question, with their TA or lecturer.
- After time is called, students must put down all writing instruments and remain in their seats, while the TAs will collect the scantrons and the exams.
- Any violation of these rules and any act of academic dishonesty may result in severe penalties.Additionally, all violators will be reported to the Office of the Dean of Students.

I have read and understand the exam rules stated above:

STUDENT SIGNATURE:	

5. HOW MANY VERSIONS?

- There will be 9 versions of the exam
- To be graded correctly, you need to fill out the Test Number on your Scantron:

MA 16100 EXAM 2 - 10/18/2022 TEST/201Z NUMBER
NAME YOUR TA'S NAME
TUDENT ID # RECITATION TIME
You must use a $\#2$ pencil on the scantron answer sheet. Fill in the following on your scantron and blacken the bubbles
1. Your name. If there aren't enough space for your name, fill in as much as you can.
2. Section number with a leading zero, e.g. 0302. (If you don't know your section number, ask your TA.)
3. Test/Quiz number: 88
4. Student Identification Number: This is your Purdue ID number with two leading zero

5. Blacken in your choice of the correct answer on the scantron answer sheet for

SECTION NUMBER	TEST/QUIZ NUMBER	STUDENT IDENTIFICATION NUMBER									
0302	88	0012345678									
000	00										
11111	1										
222	22	222022222									
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444	44	44444444									
5 5 5	5 5	5 5 5 5 5 5 5 5									
6666	66	666666666									
7070	77	00000000000									
888	0 0	8 8 8 8 8 8									
9999	99	99999999									

6. RULES FOR ARRIVING LATE

Timer:	Late Arrivals:	Leaving Early:
Timer starts at 120 minutes and counts down	Can students who arrive to the exam late take the exam?	Can students who finish the exam leave early?
120 min – 100 min	Yes	No
100 min – 10 min	No*	Yes
10 min – 0 min	No*	No

• Students who arrive after the first 20 minutes must talk to Dr. Hood to arrange for an alternate exam with a 20% late penalty

1. Suppose the domain of f(x) is $[0, \infty)$. If

$$g(x) = 1 - f(x+1)$$

then what is the domain of the function g?

- A. $(-\infty, 1]$
- B. $(-\infty, -1]$
- C. $[-1,\infty)$
- D. $[0,\infty)$
- E. $[1,\infty)$

2. If
$$f(x) = \frac{x+5}{x+1}$$
, simplify the expression

$$\frac{f(x) - f(3)}{x - 3}$$

A.
$$\frac{-2}{x-3}$$

B.
$$\frac{-1}{x+1}$$

$$C. \ \frac{-4}{(x+1)^2}$$

$$D. \ \frac{3-x}{x+1}$$

$$E. \frac{x+3}{x-3}$$

3. The curve

$$y = \frac{1 - 2x}{x^3 - 1}$$

has one horizontal asymptote, y = h, and one vertical asymptote, x = k. What is h + k?

- A. 1
- B. 3
- C. -1
- D. $\frac{1}{2}$
- E. $\frac{3}{2}$

4. Consider the function

$$f(x) = \begin{cases} -1 & \text{if } x < 0 \\ 0 & \text{if } x = 0 \\ 1 & \text{if } x > 0 \end{cases}$$

Which of the following limits exist?

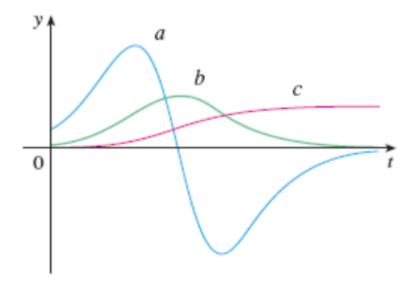
(i)
$$\lim_{x \to 0^+} f(x)$$

(ii)
$$\lim_{x \to 0} f(x)$$

(i)
$$\lim_{x \to 0^+} f(x)$$
 (ii) $\lim_{x \to 0} f(x)$ (iii) $\lim_{x \to 0} |f(x)|$

- A. (i) only
- B. (i) and (iii) only
- C. (ii) and (iii) only
- D. (ii) only
- E. (iii) only

5. The figure shows the graphs of three functions. One is the position function of a car, one is the velocity of the car, and one is its acceleration. Find the correct choice.



- A. a = acceleration, b = position, c = velocity
- B. a = velocity, b = position, c = acceleration
- C. a = acceleration, b = velocity, c = position
- D. a = position, b = velocity, c = acceleration
- E. a = velocity, b = acceleration, c = position

6. Find the limit.

$$\lim_{x \to 2} \sqrt{\frac{x^2 - 4}{x - 2}}$$

- A. Does not exist
- B. 0
- C. 4
- D. 2
- E. ∞

7. Find the limit.

$$\lim_{x \to 0} \frac{\csc(3x)}{\cot x}$$

A.
$$\frac{1}{3}$$

B.
$$\infty$$

8. Find the limit.

$$\lim_{x \to \infty} \left(1 + \frac{3}{x} \right)^{4x}$$

A. e^4

B. 4

C. e^{12}

D. 12

E. $e^{3/4}$

9. The half life of a certain substance is 1000 years. How much of a sample weighing 100 kg remains after 100 years?

- A. 10 kg
- B. $10 \ln(2) \text{ kg}$
- C. 95 kg
- D. $\frac{100}{\sqrt[10]{2}} \text{ kg}$
- E. $10 \sqrt[10]{2} \text{ kg}$

10. If
$$f(x) = \frac{x^2 + 3x - 4}{x^2 - 1}$$
 then $f'(x) =$

A.
$$\frac{-3x^2 - 10x - 3}{x^4 - 2x^2 + 1}$$

B.
$$\frac{-3}{x^2 - 2x + 1}$$

$$C. \ \frac{2x+3}{2x}$$

D.
$$\frac{9x^2 - 10x - 3}{x^4 - 2x^2 + 1}$$

E.
$$\frac{-3}{x^2 + 2x + 1}$$

11. If $f(x) = \log_{10}(x)$ then f'(e) =

A. 1

B. $\frac{1}{10}$

C. $\frac{1}{e}$

D. $\frac{1}{e \ln(10)}$

E. $\frac{e}{10}$

12. If $f(x) = (1 - x^2) \sin^{-1}(x)$ then f'(x) =

$$A. \frac{-2x}{\sqrt{1-x^2}}$$

B.
$$\sqrt{1-x^2} - 2x\sin^{-1}(x)$$

C.
$$1 - 2x \sin^{-1}(x)$$

D.
$$-2x \cos^{-1}(x)$$

E.
$$\frac{1-x^2}{1+x^2} - 2x\sin^{-1}(x)$$

13. If for differentiable functions f(x) and g(x) we have f(2) = 2, f(3) = 5, f'(2) = -3, f'(3) = 7 and g(2) = 3, g(3) = 2, g'(2) = -1, g'(3) = -3, then

$$\frac{d}{dx}f(g(x))\Big|_{x=2} =$$

- A. 3
- B. -7
- C. 7
- D. 21
- E. -9

12. A storage crate is to be built in the shape of a box with a square base. It is to have volume 10 cubic feet. The material for the base costs \$4 per square foot, the material for the lid costs \$1 per square foot, and the material for the sides costs \$2 per square foot. If a is the width of the crate and h is the height, what are the dimensions of the crate the minimizes the cost?

A.
$$a = \sqrt{10} \text{ and } h = 1.$$

B.
$$a = \sqrt{2}$$
 and $h = 5$

C.
$$a = 2 \text{ and } h = \frac{5}{2}$$

D.
$$a = \sqrt{5}$$
 and $h = 2$

E.
$$a = 1 \text{ and } h = 10$$