

The Almagest

The bi-weekly newsletter of the Alma College Department of Mathematics and Computer Science. Your trusted source for news.

Volume 12 No. 11

April 2, 2020



We Miss You All

The Math and C.S. faculty wish you and your families well during these unprecedented times.

Please don't hesitate to contact your professors if you have any feedback on online courses, or any questions about assignments or final exams.

The forecasts for the spread of the coronavirus all come from mathematical models. So it's fair to say that mathematical models have never been as important and influential in our lives as they are now. In the future, it will be interesting to study these models in detail.

For the present, please stay safe and as optimistic as possible! We miss you all and hope we are all back together in Alma soon.

Spring Term Course with Dr. Dexter

Spring Term course registration is now available again. If you are looking to add a Spring Term course this year, please consider **CSC-180: Technology and Dis/ability** with Dr. Dexter.

Remaining Senior Presentations

Senior presentations are now being livestreamed via Google Meet! If you would like to watch, please contact any Math/C.S. faculty member for the link. The remaining talks are:

Tuesday, April 7th

4:00 *Nathan Haut (Senior Thesis)*

Thursday, April 9th

4:00 *Leighton Collingwood*

Congratulations to Graduates

Congratulations to all seniors who are graduating this year! We appreciate the commitment you have given to your education, and we know that wonderful things await you in the future. We are sad that we cannot celebrate your graduation as planned, but we trust that a time will come soon when we will celebrate with you.

Data Analytics Minor

The Alma faculty have approved a new minor in Data Analytics. Please contact Dr. Dexter, Thall, or Westgate if you have any questions about the minor. These are the course requirements:

- DAT 115: Introduction to Data Analytics
Has been taught previously as MTH-180 (Data Mining). Will be offered this coming Fall term.
- Intro. to programming: DAT 116 or CSC 120
DAT 116 is currently being taught as CSC 180.
- MTH 242: Applied Statistical Methods
- DAT 315: Machine Learning
CSC 345: Artificial Intelligence will count for this course this coming Fall term
- Data analytics project (2 credits)
- Electives: 8 credits from the following courses (or other approved courses with a focus on data):
 - CSC 345: Artificial Intelligence
 - CSC 410: Database Management
 - ECN 217: Quantitative Methods
 - ECN 317: Econometrics
 - HCA 405: Health Care Informatics
 - IPH 330: Health Data Analysis
 - MTH 116: Elementary Statistics
 - MTH 118: Biostatistics
 - MTH 341: Probability and Statistics I
 - PHY 221: Modern Physics
 - POL 217: Democracy's Slow Death
 - PSY 220: Statistics

Turing Completeness and the World of Accidental Computers

A system of data-manipulation is Turing complete if it is able to simulate any Turing machine. Similarly two systems are Turing Equivalent if they are able to simulate each other. This idea is explored further in the Church-Turing thesis which conjectures that any system that can be computed by an algorithm can also be computed by a Turing machine. This shows that if any computer is able to simulate a Turing machine, then it is also equivalent to a Turing Machine. This idea doesn't just apply to computers.

Most commonly used programming languages such as C++, Java and Python are Turing complete. While some systems are designed so that they are Turing complete, many systems arise that are Turing complete by accident. Games such as Minesweeper and Minecraft are capable of simulating Turing machines if they are able to extend infinitely. The card game Magic: The Gathering is also Turing complete, and the implementation of the card game as a Turing machine is explored in the Youtube video "I Built a COMPUTER in Magic: The Gathering". ~ *Brandon Hart*

Solution to Previous Puzzle

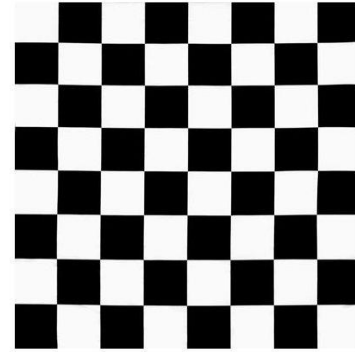
The minute hand on a clock is 8 inches long and the hour hand is 6 inches long. How fast is the distance between the tips of the hands changing at three o'clock?



Congratulations to **Mason Renne** and **Colleen Loftus**, who both submitted the correct answer of $-44\pi/5 \approx -27.6$ inches/hour.

Puzzle of the Bi-week

How many rectangles, including squares, are contained in an 8 x 8 chess board? For example, there are sixty-four 1 x 1 rectangles and one 8 x 8 rectangle.



A prize of **everlasting honor and glory** will be awarded to the 1st student who submits a correct solution to **Dr. Molina**.

Student assistant:	Brandon Hart
Faculty advisor:	Brad Westgate
Distribution:	Jackie Gage SAC 224



ALMA COLLEGE