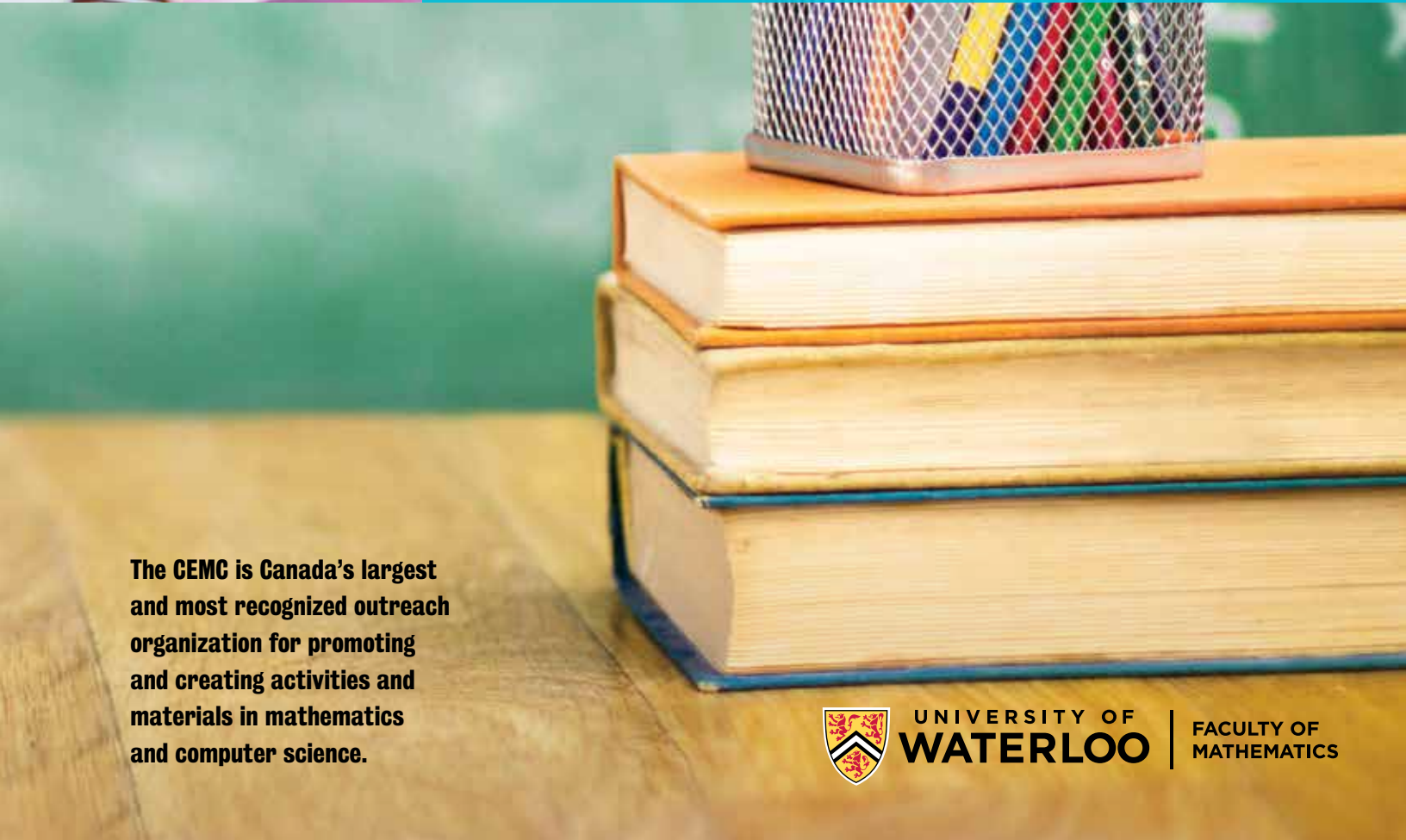




**The CENTRE for EDUCATION in  
MATHEMATICS and COMPUTING**

[cemc.uwaterloo.ca](http://cemc.uwaterloo.ca)



**The CEMC is Canada's largest  
and most recognized outreach  
organization for promoting  
and creating activities and  
materials in mathematics  
and computer science.**



UNIVERSITY OF  
**WATERLOO**

FACULTY OF  
MATHEMATICS

# MATHEMATICS AND COMPUTING CONTESTS

The CEMC develops and administers internationally recognized contests that inspire students to develop an interest in and love for mathematics and computer science.

## OUR CONTESTS:

- › are accessible to a large range of students and are also challenging to the very best students
- › help students to develop their problem solving skills
- › have 265,000 registrations from more than 80 countries each year



CONTEST	GRADES	MONTH	FORMAT
Beaver Computing Challenge	5 to 10	November	Multiple choice Written online
Canadian Intermediate Mathematics Contest	9 & 10	November	Answer only and full solution
Canadian Senior Mathematics Contest	11 & 12	November	Answer only and full solution
Canadian Computing Competition	9 to 12	February	Programming Written online
Pascal	9	February	Multiple choice
Cayley	10	February	Multiple choice
Fermat	11	February	Multiple choice
Fryer	9	April	Answer only and full solution
Galois	10	April	Answer only and full solution
Hypatia	11	April	Answer only and full solution
Euclid	12	April	Answer only and full solution
Canadian Team Mathematics Contest	9 to 12	April	Team, individual and relay events
Gauss	7	May	Multiple choice
Gauss	8	May	Multiple choice

Visit [cemc.uwaterloo.ca](http://cemc.uwaterloo.ca) to find more information and to download free copies of past contests and full solutions.

## MASTER OF MATHEMATICS FOR TEACHERS

Earn a Master's degree online by learning mathematics designed to help improve your teaching.

### THE MMT:

- › designed for current math teachers
- › is a part-time, online Master's degree available from anywhere in the world
- › gives a deeper understanding of the mathematical foundations relating to core secondary school curricula
- › provides exposure to important applications of mathematics
- › has no requirement to be in Waterloo

“MMT course material is challenging but attainable, and very rewarding. I have developed new course materials as a direct result of the MMT program, and additionally my classes are now more consciously directed at some of the deeper concepts presented in the program, much to the benefit and delight of my students. Being a student again has given me perspective on the lives of my own students and has made me more effective at understanding their challenges. I highly recommend the MMT program for any high school math teacher. In fact, I would even go so far as to say it should be mandatory!”

– MMT graduate, Toronto, Ontario

# CEMC COURSEWARE

[cemc.uwaterloo.ca/courseware/](http://cemc.uwaterloo.ca/courseware/)

Use online materials featuring curriculum-based lessons, interactive activities, enrichment challenges, and unlimited opportunity for practice with feedback. The courseware is free to use and does not require registration. Start learning from a world-class group of educators today!

## CURRENTLY AVAILABLE:

- › Grade 7/8 Mathematics
- › Grade 9/10/11 Mathematics
- › Grade 12 Advanced Functions and Pre-Calculus
- › Grade 12 Calculus and Vectors
- › Problem Solving and Mathematical Discovery
- › Computer Science: Python from Scratch
- › Computer Science: Language Independent Programming Lessons
- › Computer Science: Web Basics
- › Computer Science: Web Programming

**NEW**  
2019/2020

Visit [cemc.uwaterloo.ca](http://cemc.uwaterloo.ca) to find more information and to learn about additional resources.



## WEB RESOURCES

Explore our free online resources that both support mathematics and computer science education in the classroom, and provide enrichment opportunities.

<b>MATHFROG</b> Grades 4 to 6	<b>INVITATIONS TO MATHEMATICS</b> Grades 4 to 6	<b>WIRED MATH</b> Grades 7 to 10
Integrates online games with paper and pencil exercises	E-books to assist mathematics teachers, arranged by strand	Integrates online games with exercises, challenge problems, and enrichment
<b>MATH CIRCLES</b> Grades 6 to 12	<b>PROBLEM OF THE WEEK</b> Grades 3 to 12	<b>REAL-WORLD MATH</b> Grades 7 to 12
Electronic material including videos, presentation outlines and problem sets	Weekly email subscription providing opportunity to solve grade-specific problems	Problem solving activities related to applications
<b>MATH AND CS IN THE NEWS</b> Grades 9 to 12	<b>PROBLEM SET GENERATOR</b> Grades 7 to 11	<b>CS CIRCLES</b> Grades 9 to 12
Regular feature linking to stories in the world news showing the use of mathematics and computer science	Allows anyone to create random sets of problems from past contests	Self-contained modules that teach computer programming

# CEMC WORKSHOPS AND CONFERENCES

## For Students

### Math Circles

- > weekly on-campus enrichment activity for students in grades 6 to 12

### Workshop in Computer Science for Young Women

- > week-long workshop for female students from across Canada
- > designed to spark interest in computer science
- > lectures, labs, hands-on activities

### Programming Challenge for Girls

- > one-day on-campus event
- > introduces programming to girls in early high school
- > learn the basics of object-oriented programming through hands-on tutorials and challenges

### Think About Math!

- > workshop demonstrating that math is fun, relevant, and leads to exciting careers
- > designed for girls in early high school to ignite enthusiasm for mathematics

## For Teachers

### Summer Conference for Computer Studies Educators

- > annual conference for computer science and computer engineering teachers
- > network with other teachers, learn new skills and brainstorm classroom activity ideas

### Math Teachers' Conference

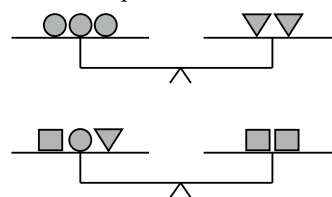
- > annual conference for mathematics teachers
- > focuses on problem solving, curriculum, technology and enrichment



Visit [cemc.uwaterloo.ca](http://cemc.uwaterloo.ca) to find more information and to learn about other face-to-face opportunities.

### SAMPLE PROBLEM

The two equal-arm scales shown are balanced.



Of the following,  $\bigcirc \nabla \nabla \nabla$  has the same mass as

- (A)  $\square \square \square$
- (B)  $\nabla \nabla \square \square$
- (C)  $\bigcirc \bigcirc \bigcirc \bigcirc$
- (D)  $\bigcirc \bigcirc \bigcirc \square$
- (E)  $\bigcirc \bigcirc \bigcirc$



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