The CENTRE for EDUCATION in MATHEMATICS and COMPUTING
presents the

2018 Canadian Team Mathematics Contest (CTMC)

Instructions for Running the CTMC in your School

Supervision
These instructions are written for a scenario where each team of six students has a coach supervising the events. In particular, during the Relay Event, each team's coach ensures that answer sheets are passed fairly and initialled at the Early-Bird mark.

If you run the event with a large number of teams and are encouraging competition between those teams, you may wish to have a coach for each team. If you have a few teams and are emphasizing fun and fair competition, you may adapt the instructions regarding the coach to something less formal.

Printing and Preparing Materials

1. All contest materials will be available for download beginning April 5 at 4pm EDT from http://cemc2.math.uwaterloo.ca/contest/CTMC/repository.php. To log in, use the same School Number and password that you used to register for CTMC. We recommend testing your access to this site before you need the materials. If you have forgotten your password, visit https://cemc2.math.uwaterloo.ca/contest/Results/loginHelp.php.

2. In advance of running the contest, print one copy of 2018CTMCMaterials.pdf, SINGLE-SIDED, for each team of six students participating. You may wish to use a different colour of paper for each team participating so that you can easily sort and identify materials for each team. You can view SampleCTMCMaterials.pdf to get a sense of the file's formatting.

3. We recommend grouping the contents for each Event in advance.

   - **Individual Event**: One Answer Form and one copy of the Problems per student.
     One Team Summary form, that markers can use to report the score for each member of the team.
   - **Team Event**: One Answer Form to be used by each whole team. One copy of the Problems per student. We recommend stapling the six Problem sets.
   - **Relay Event**: For each relay event (Problems numbered 0,1,2,3) you will find one Problem labelled for each of the six Seats (1a, 1b, 1c, 2a, 2b, 2c). Please fold each Problem sheet along the fold line. Additionally, the students in Seats 1c and 2c will receive an Answer Form.
   - **Answer Keys:** One copy for you to mark your team's work.

4. **Tear-off Booklets:** For each team of six students, for the Relay event you will need four tear-off booklets with only enough space to write down a numeric answer to each question (not the full calculations). These are not included in the contest materials. You can make these yourself by stapling together small strips of paper (about 10 strips per booklet). Alternatively, use small stickie pads.

5. **Scrap Paper** may be provided to students during all events.

Individual Event: 45 minutes. Begin no earlier than Friday, April 6.

1. Calculating devices are allowed, but only during the Individual and Relay events. You may not use a device that has any of the following features: (i) internet access, (ii) the ability to communicate with other devices, (iii) previously stored information such as formulas, programs, notes, etc., (iv) a computer algebra system, (v) dynamic geometry software.

2. Express answers as simplified exact numbers except where otherwise indicated. For example, $\pi + 1$ and $1 - \sqrt{2}$ are simplified exact numbers.

3. Students may use paper dictionaries for translation between English and another language. Students may not use electronic translation devices.

4. Provide each student with a copy of the problems and an answer form. Students work individually with no communication amongst them.

5. Ensure each student writes their name on their sheet. At the end of 45 minutes, collect each Individual Answer Form and the Individual Event Team Summary form. If you or your students will want to know each Individuals score, please note the Competitor Letter for each student on their sheet.

Team Event: 45 minutes.

1. **No calculators are allowed.**

2. Express answers as simplified exact numbers except where otherwise indicated. For example, $\pi + 1$ and $1 - \sqrt{2}$ are simplified exact numbers.

3. Provide each student with a copy of the problems.

4. There are too many questions to be done by just a few people. The team members should decide on a strategy for sharing the work. The team will complete a single form with one answer to each question. Team members may collaborate in solving the problems. Coaches may not assist the team.

5. Once your team is settled, you may have some time to do your own work or reading. Please sit in the room with your team and ensure they are working fairly.

6. Monitor the time, giving a five minute warning before the end of the allotted time.

7. Collect the Team Answer Form at the end of 45 minutes.

Relay Event: 3 minutes for Relay 0, and 8 minutes for each of Relays 1, 2, 3

1. Calculating devices are allowed, but only during the Individual and Relay events. You may not use a device that has any of the following features: (i) internet access, (ii) the ability to communicate with other devices, (iii) previously stored information such as formulas, programs, notes, etc., (iv) a computer algebra system, (v) dynamic geometry software.

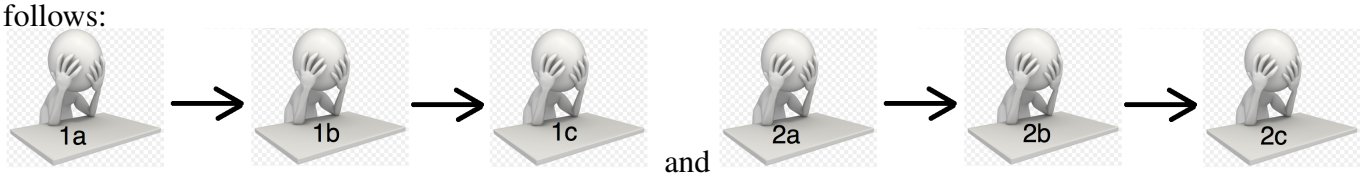
2. For Relay 0, allow 2 minutes until the Early Answer mark, and another 1 minute until the relay is completed.

3. For each of Relays 1, 2 and 3, allow 4 minutes until the Early Answer mark, and another 4 minutes until the relay is completed.

4. **Note:** Relay 0 will not count towards the team's score. It is a practice round so students can understand the way the relay works.

5. Assign each student a seat number: (1a, 1b, 1c, 2a, 2b, 2c). Have the students sit so that they can pass sheets appropriately. Ensure they know who will pass to whom. You may wish to label the seats in advance; the CTMC download site includes a template for printing labels.

6. During the relay, as students complete their question, they will pass their answer from seat to seat as follows:



7. There is no interaction between students in seat numbers beginning with 1 and students in seat numbers beginning with 2.

8. The same question will be completed (although without interaction) by students 1a and 2a, by students 1b and 2b, and by students 1c and 2c.

9. Students working on b or c can begin working on their question when the relay starts. They will need the answer from the previous student before they can complete the question.

10. The acronym TNYWR ("the number you will receive") indicates how to use the answer passed to them from the previous student. For example:

Relay Problem #0 (Seat 2c)

Let t be TNYWR.
The lines with equations $y = 13$ and $y = 3x + t$ intersect at the point (a, b). What is the value of a?

11. Distribute the appropriate relay question sheet, folded so that the question is face-down, according to each student's seat number.
    - Provide an Answer Form to students in seats 1c and 2c.
    - Provide a tear-off booklet to students in seats 1a, 1b, 2a, 2b. The students will use these slips to pass their answer to the next student.
12. Students in seats b or c may not pass back an answer received form the previous student (i.e. From b to a, or from c to b). They must accept and work with the answer they receive.
13. If students in seats 1a, 1b, 2a or 2b discover an error in their work, they can calculate a new answer and pass it along.
14. At the 4-minute mark, the coach should initial the answer given in the Early Answer box on both answer forms (1c and 2c). If no answer was written, the coach should strike through the Early Answer box. After that, a student in seat c may mark only the Final Answer box.

    After 8 minutes, the coach will collect the completed answer sheets from students 1c and 2c. Ensure that the team name is written on the answer forms.

Answer Sheet for Relay #0, Seat 1c

Team _____

Early Answer	
Final Answer	

For seats 1c and 2c, scores are according to whether the answer in each box is correct (✓), incorrect (×), or blank. The Answer Key includes answers for seats a and b, but no part marks are awarded for seats a or b.

Early Answer	✓	✓		×	×		✓	×	
Final Answer		✓	✓	✓	×		×		×
Score	10	10	5	5	0	0	0	0	0

Scoring the Contest

1. Use the Answer Keys to mark each Answer Form.
2. There are no part marks awarded. You may give full marks to an answer equivalent to the Answer Key (for example, an equivalent fraction or ratio not expressed in lowest terms).
3. Correct answers score points as follows:
    - **Team Event**: 3 marks for each correct answer
    - **Individual Event**: 1 mark for each correct answer, for each student
    - **Relay 0**: No marks are awarded. This relay is just to practice the logistics of a relay.
    - **Relays 1, 2, 3**: For each of seats 1c and 2c, scores are as follows according to whether the answer in each box is correct (✓), incorrect (×), or blank. The Answer Key includes the answers for seats a and b, but no part marks are awarded for seats a or b.

Early Answer	✓	✓		×	×		✓	×	
Final Answer		✓	✓	✓	×		×		×
Score	10	10	5	5	0	0	0	0	0

    - **Bonus**: All teams receive a bonus of 5 points.

    We provide a spreadsheet called 2018CTMCScoreSheet.xlsx. If you enter the raw scores, it will compute your team's score as above.
4. The CEMC does not collect scores or award prizes to teams writing the CTMC at their own location. After the contest, we will send you statistical information about the scores of teams who wrote the CTMC at UW's campus. You can use this to gauge your team's relative standing.