



The CENTRE for EDUCATION
in MATHEMATICS and COMPUTING
cemc.uwaterloo.ca

Fermat Contest

(Grade 11)

Wednesday, February 25, 2026
(in North America and South America)

Thursday, February 26, 2026
(outside of North America and South America)



UNIVERSITY OF
WATERLOO

Time: 60 minutes

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Calculating devices are allowed, provided that they do not have any of the following features: (i) internet access, (ii) the ability to communicate with other devices, (iii) information previously stored by students (such as formulas, programs, notes, etc.), (iv) a computer algebra system, (v) dynamic geometry software.

Instructions

1. Do not open the Contest booklet until you are told to do so.
2. You may use rulers, compasses and paper for rough work.
3. Be sure that you understand the coding system for your response form. If you are not sure, ask your teacher to clarify it. All coding must be done with a pencil, preferably HB. Fill in circles completely.
4. On your response form, print your school name and city/town in the box in the upper right corner.
5. **Be certain that you code your name, age, grade, and the Contest you are writing in the response form. Only those who do so can be counted as eligible students.**
6. Part A and Part B of this contest are multiple choice. Each of the questions in these parts is followed by five possible answers marked **A**, **B**, **C**, **D**, and **E**. Only one of these is correct. After making your choice, fill in the appropriate circle on the response form.
7. The correct answer to each question in Part C is an integer from 0 to 99, inclusive. After deciding on your answer, fill in the appropriate two circles on the response form. A one-digit answer (such as “7”) must be coded with a leading zero (“07”).
8. Scoring: Each correct answer is worth 5 in Part A, 6 in Part B, and 8 in Part C.
There is *no penalty* for an incorrect answer.
Each unanswered question is worth 2, to a maximum of 10 unanswered questions.
9. Diagrams are *not* drawn to scale. They are intended as aids only.
10. When your supervisor tells you to begin, you will have 60 minutes of working time.
11. You may not write more than one of the Pascal, Cayley and Fermat Contests in any given year.

Do not discuss the problems or solutions from this contest online for the next 48 hours.

The name, grade, school and location, and score range of some top-scoring students will be published on our website, cemc.uwaterloo.ca. In addition, the name, grade, school and location, and score of some top-scoring students may be shared with other mathematical organizations for other recognition opportunities.

Scoring: There is *no penalty* for an incorrect answer.
 Each unanswered question is worth 2, to a maximum of 10 unanswered questions.

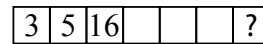
Part A: Each correct answer is worth 5.

1. The cost to buy 2 F-MAT calculators is \$30. The cost to buy 4 F-MAT calculators is
- (A) \$15 (B) \$45 (C) \$60 (D) \$75 (E) \$120

2. The value of $\frac{101^2 - 101}{100}$ is
- (A) 101 (B) 1 (C) 100 (D) 0 (E) 10 200

3. A math club had 24 members in its first year. In the second year, the membership increased by 50%. How many members were there in the second year?
- (A) 54 (B) 48 (C) 36 (D) 42 (E) 60

4. The squares shown are each filled with a number so that the sum of the numbers in every group of three consecutive squares is 24. What number appears in the square marked with a question mark?



- (A) 3 (B) 5 (C) 8
 (D) 16 (E) 24

5. The right side of the equation below represents some number of 4s added together.

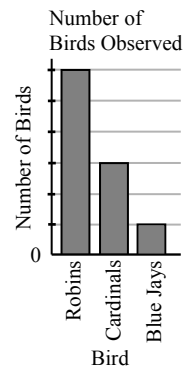
$$4^3 = 4 + 4 + 4 + \cdots + 4$$

How many 4s are in the sum?

- (A) 12 (B) 24 (C) 8 (D) 16 (E) 3

6. Fermat buys 8 bananas and 4 apples. The cost of each banana is half the cost of each apple. If the total cost of the fruit is \$16.00, what is the cost of each apple?
- (A) \$0.50 (B) \$1.33 (C) \$4.00 (D) \$2.67 (E) \$2.00

7. Leah went for a walk and recorded the number of robins, cardinals and blue jays that she saw in the bar graph shown. Unfortunately, she forgot to include numbers on the vertical axis. If a total of 30 robins, cardinals and blue jays were observed, how many robins did she see?



- (A) 9 (B) 12 (C) 15
 (D) 18 (E) 21

8. Suppose that a, b, c, d are four *consecutive* positive integers with $a < b < c < d$. The value of $(a + d) - (b + c)$ is

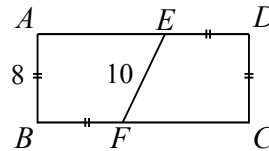
- (A) -1 (B) 0 (C) 1 (D) 2 (E) 3

9. A square has an area of 10. Each of its side lengths is multiplied by the same positive integer to produce a new square. Which of the following could be the area of the new square?
 (A) 60 (B) 70 (C) 80 (D) 90 (E) 100
10. The faces of a six-sided die are numbered 1 to 6. The faces of an eight-sided die are numbered 1 to 8. Each die is rolled once. What is the probability that the same number is rolled on both dice?
 (A) $\frac{1}{64}$ (B) $\frac{1}{6}$ (C) $\frac{1}{48}$ (D) $\frac{1}{36}$ (E) $\frac{1}{8}$

Part B: Each correct answer is worth 6.

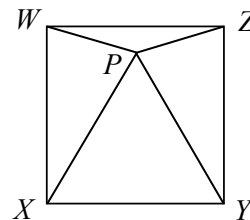
11. Maria drove 500 km in 8 hours. Andrea flew a helicopter 1500 km and averaged a speed that was four times Maria's average driving speed. How long did Andrea's flight take?
 (A) 1.5 hours (B) 2 hours (C) 4 hours (D) 6 hours (E) 8 hours
12. How many positive integers less than 100 can be written as the sum of three consecutive positive integers?
 (A) 97 (B) 98 (C) 94 (D) 32 (E) 33

13. Points E and F are positioned on the sides of rectangle $ABCD$ so that $BF = ED = DC = AB = 8$ and $EF = 10$, as shown. The area of rectangle $ABCD$ is
 (A) 192 (B) 176 (C) 144
 (D) 208 (E) 128

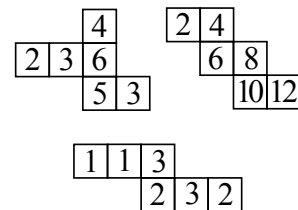


14. Ava painted one picture each day for 31 consecutive days and numbered the paintings consecutively from 1 to 31. Three of the pictures that she painted on Sundays have even numbers. On what day did she paint the picture numbered 25?
 (A) Monday (B) Tuesday (C) Wednesday (D) Thursday (E) Friday
15. How many ordered pairs of positive integers (x, y) have the property that the ratio $x : 4$ equals the ratio $9 : y$?
 (A) 6 (B) 7 (C) 8 (D) 9 (E) 10

16. In the diagram, point P lies inside square $WXYZ$ so that $\triangle PXY$ is an equilateral triangle. The measure of $\angle WPZ$ is
 (A) 150° (B) 135° (C) 90°
 (D) 120° (E) 160°



17. Each of the three nets shown is folded to create a cube. The three cubes are then arranged so that the numbers on their top faces are 1, 2 and 3, in some order. The sum of the three numbers on their bottom faces is
 (A) 8 (B) 10 (C) 12
 (D) 14 (E) 16



18. Suppose that x and y are integers satisfying $-4 \leq x \leq 11$ and $9 \leq y \leq 17$. Which of the following statements is correct for all such values of x and y ?
- (A) $-2 \leq x - y \leq 21$ (B) $6 \leq x - y \leq 13$ (C) $-13 \leq x - y \leq -6$
(D) $5 \leq x - y \leq 28$ (E) $-21 \leq x - y \leq 2$
19. There are 28 balls in a bag. Each ball is coloured 1 of 7 colours and has 1 of 4 patterns. No two balls have the same colour and pattern combination. Exactly 3 balls are removed from the bag, one at a time without replacement. What is the probability that one of the last two balls removed matches the colour of the first ball and the other matches the pattern of the first ball?
- (A) $\frac{1}{14}$ (B) $\frac{2}{39}$ (C) $\frac{28}{351}$ (D) $\frac{1}{13}$ (E) $\frac{4}{39}$
20. Arushi wrote an integer in each cell of a 3×4 grid so that the sum of the numbers in each row and in each column was the same. Some of the integers that Arushi wrote are shown in the grid while the others remain hidden. The value of $c - d$ is
- | | | | |
|---|----|-----|-----|
| | 7 | | 3 |
| 4 | | c | |
| | -1 | | d |
- (A) -1 (B) 0 (C) 5
(D) 10 (E) 13

Part C: Each correct answer is worth 8.

Each correct answer is an integer from 0 to 99, inclusive.

A one-digit answer (such as “7”) must be coded with a leading zero (“07”).

Note: The integer formed by the rightmost two digits of 12 345 is 45.

The integer formed by the rightmost two digits of 6307 is 7, coded 07.

21. Points P and Q are on the parabola with equation $y = -3x^2 + 4x + 27$. The midpoint of PQ is $(0, 0)$. If P lies above the x -axis, what is the y -coordinate of P ?
22. A rectangle with height 20 cm and width 26 cm is painted with n vertical strips and n horizontal strips. Each vertical strip has height 20 cm and width 2 cm. Each horizontal strip has height 2 cm and width 26 cm. Each vertical strip overlaps each horizontal strip. Vertical strips do not overlap one another, and horizontal strips do not overlap one another. The area of the painted portion of the rectangle is $\frac{12}{13}$ of the area of the rectangle. What is the value of n ?
23. The string of digits 123451234551234555... is formed by alternately writing the digits 1234, in that order, and then writing some number of consecutive 5s. There are exactly k consecutive 5s immediately following the k th occurrence of 1234. If S is the sum of the first 2026 digits of the string, what is the sum of the digits of S ?
24. Adam collects n rocks, where $100 < n < 300$. The ratio of the number of grey rocks collected to the number of spotted rocks collected is $5 : 2$. The number of rocks that are both grey and spotted is m , and is equal to the number of rocks that are neither grey nor spotted. What are the rightmost two digits of the number of possible ordered pairs of integers (m, n) ?
25. The integers between 1 and 10 inclusive are to be arranged in a line so that if the integer a is divisible by the integer b , then a appears to the left of b . For example, 6, 10, 8, 5, 9, 3, 4, 7, 2, 1 is one such arrangement. Let N be the number of ways in which this can be done. What are the rightmost two digits of N ?



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For students...

Thank you for writing the 2026 Fermat Contest! Each year, more than 265 000 students from more than 80 countries register to write the CEMC's Contests.

Encourage your teacher to register you for the Hypatia Contest which will be written in April.

Visit our website cemc.uwaterloo.ca to find

- More information about the Hypatia Contest
- Free copies of past contests
- Information about careers in and applications of mathematics and computer science

For teachers...

Visit our website cemc.uwaterloo.ca to

- Register your students for the Fryer, Galois and Hypatia Contests which will be written in April
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- Use our free Problem Set Generator to create problem sets for curriculum support and enrichment
- Learn about our face-to-face workshops and our web resources
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