



# Canadian Mathematics Competition

An activity of The Centre for Education  
in Mathematics and Computing,  
University of Waterloo, Waterloo, Ontario

## *Gauss Contest (Grade 7)*

(Grade 8 Contest is on the reverse side)

**Wednesday, May 17, 2000**

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**Time:** 1 hour

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**Calculators are permitted.**

### Instructions

1. Do not open the examination booklet until you are told to do so.
2. You may use rulers, compasses and paper for rough work.
3. Be certain that you understand the coding system for your answer sheet. If you are not sure, ask your teacher to explain it.
4. This is a multiple-choice test. Each question is followed by five possible answers marked **A**, **B**, **C**, **D**, and **E**. Only one of these is correct. When you have decided on your choice, enter the appropriate letter on your answer sheet for that question.
5. 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 20.
6. Diagrams are *not* drawn to scale. They are intended as aids only.
7. When your supervisor tells you to start, you will have *sixty* minutes of working time.

## Grade 7

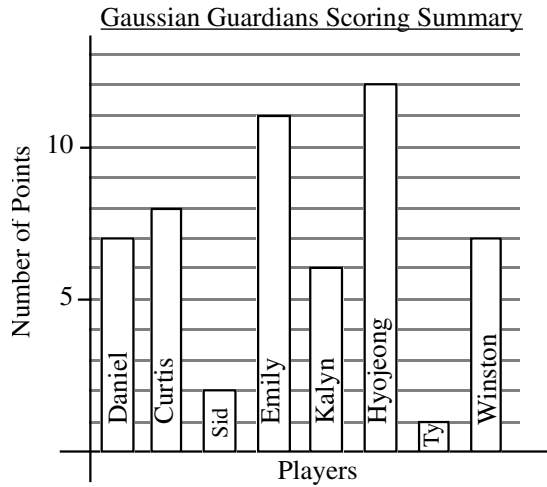
Scoring: There is *no penalty* for an incorrect answer.  
Each unanswered question is worth 2 credits, to a maximum of 20 credits.

**Part A** (5 credits each)

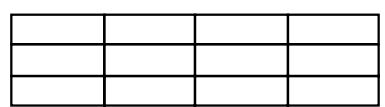
1. The value of  $987 + 113 - 1000$  is  
(A) 90                      (B) 10                      (C) 110                      (D) 2000                      (E) 100
2. As a decimal,  $\frac{9}{10} + \frac{8}{100}$  is  
(A) 1.098                      (B) 0.98                      (C) 0.098                      (D) 0.0908                      (E) 9.8
3. What integer is closest in value to  $7 \times \frac{3}{4}$ ?  
(A) 21                      (B) 9                      (C) 6                      (D) 5                      (E) 1
4. The value of the expression  $5^2 - 4^2 + 3^2$  is  
(A) 20                      (B) 18                      (C) 21                      (D) 10                      (E) 16
5. When a number is divided by 7, it gives a quotient of 4 with a remainder of 6. What is the number?  
(A) 17                      (B) 168                      (C) 34                      (D) 31                      (E) 46
6. In the addition shown, a digit, either the same or different, can be placed in each of the two boxes. What is the sum of the two missing digits?  
(A) 9                      (B) 11                      (C) 13  
(D) 3                      (E) 7

$$\begin{array}{r} 863 \\ \square 91 \\ 7\square 8 \\ \hline 2182 \end{array}$$

7. The graph shows the complete scoring summary for the last game played by the eight players on Gaussian Guardians intramural basketball team. The total number of points scored by the Gaussian Guardians was  
(A) 54                      (B) 8                      (C) 12  
(D) 58                      (E) 46



8. If  $\frac{1}{2}$  of the number represented by  $x$  is 32, what is  $2x$ ?  
(A) 128                      (B) 64                      (C) 32                      (D) 256                      (E) 16
9. In the given diagram, all 12 of the small rectangles are the same size. Your task is to completely shade some of the rectangles until  $\frac{2}{3}$  of  $\frac{3}{4}$  of the diagram is shaded. The number of rectangles you need to shade is  
(A) 9                      (B) 3                      (C) 4  
(D) 6                      (E) 8

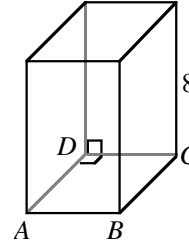


## Grade 7

10. The sum of three consecutive integers is 90. What is the largest of the three integers?  
 (A) 28                      (B) 29                      (C) 31                      (D) 32                      (E) 21

**Part B** (6 credits each)

11. A rectangular building block has a square base  $ABCD$  as shown. Its height is 8 units. If the block has a volume of 288 cubic units, what is the side length of the base?  
 (A) 6                      (B) 8                      (C) 36  
 (D) 10                      (E) 12



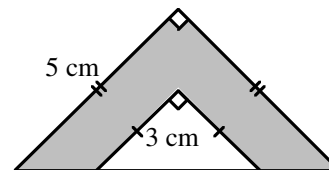
12. A recipe requires 25 mL of butter to be used along with 125 mL of sugar. If 1000 mL of sugar is used, how much butter would be required?  
 (A) 100 mL                      (B) 500 mL                      (C) 200 mL                      (D) 3 litres                      (E) 400 mL
13. Karl had his salary reduced by 10%. He was later promoted and his salary was increased by 10%. If his original salary was \$20 000, what is his present salary?  
 (A) \$16 200                      (B) \$19 800                      (C) \$20 000                      (D) \$20 500                      (E) \$24 000
14. The area of a rectangle is 12 square metres. The lengths of the sides, in metres, are whole numbers. The greatest possible perimeter (in metres) is  
 (A) 14                      (B) 16                      (C) 12                      (D) 24                      (E) 26

15. In the diagram, all rows, columns and diagonals have the sum 12. What is the sum of the four corner numbers?  
 (A) 14                      (B) 15                      (C) 16  
 (D) 17                      (E) 12

		4
	4	
	3	

16. Paul, Quincy, Rochelle, Surinder, and Tony are sitting around a table. Quincy sits in the chair between Paul and Surinder. Tony is not beside Surinder. Who is sitting on either side of Tony?  
 (A) Paul and Rochelle                      (B) Quincy and Rochelle                      (C) Paul and Quincy  
 (D) Surinder and Quincy                      (E) Not possible to tell
17.  $ABCD$  is a square that is made up of two identical rectangles and two squares of area  $4 \text{ cm}^2$  and  $16 \text{ cm}^2$ . What is the area, in  $\text{cm}^2$ , of the square  $ABCD$ ?  
 (A) 64                      (B) 49                      (C) 25                      (D) 36                      (E) 20
18. The month of April, 2000, had five Sundays. Three of them fall on even numbered days. The eighth day of this month is a  
 (A) Saturday                      (B) Sunday                      (C) Monday                      (D) Tuesday                      (E) Friday

19. The diagram shows two isosceles right-triangles with sides as marked. What is the area of the shaded region?  
 (A)  $4.5 \text{ cm}^2$                       (B)  $8 \text{ cm}^2$                       (C)  $12.5 \text{ cm}^2$   
 (D)  $16 \text{ cm}^2$                       (E)  $17 \text{ cm}^2$



20. A dishonest butcher priced his meat so that meat advertised at \$3.79 per kg was actually sold for \$4.00 per kg. He sold 1 800 kg of meat before being caught and fined \$500. By how much was he ahead or behind where he would have been had he not cheated?  
 (A) \$478 loss                      (B) \$122 loss                      (C) Breaks even                      (D) \$122 gain                      (E) \$478 gain

## Grade 7

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**Part C** (8 credits each)

21. In a basketball shooting competition, each competitor shoots ten balls which are numbered from 1 to 10. The number of points earned for each successful shot is equal to the number on the ball. If a competitor misses exactly two shots, which one of the following scores is not possible?  
 (A) 52                      (B) 44                      (C) 41                      (D) 38                      (E) 35
22. Sam is walking in a straight line towards a lamp post which is 8 m high. When he is 12 m away from the lamp post, his shadow is 4 m in length. When he is 8 m from the lamp post, what is the length of his shadow?  
 (A)  $1\frac{1}{2}$  m                      (B) 2 m                      (C)  $2\frac{1}{2}$  m                      (D)  $2\frac{2}{3}$  m                      (E) 3 m
23. The total area of a set of different squares, arranged from smallest to largest, is  $35 \text{ km}^2$ . The smallest square has a side length of 500 m. The next larger square has a side length of 1000 m. In the same way, each successive square has its side length increased by 500 m. What is the total number of squares?  
 (A) 5                      (B) 6                      (C) 7                      (D) 8                      (E) 9
24. Twelve points are marked on a rectangular grid, as shown. How many squares can be formed by joining four of these points?  
 (A) 6                      (B) 7                      (C) 9  
 (D) 11                      (E) 13
25. A square floor is tiled, as partially shown, with a large number of regular hexagonal tiles. The tiles are coloured blue or white. Each blue tile is surrounded by 6 white tiles and each white tile is surrounded by 3 white and 3 blue tiles. Ignoring part tiles, the ratio of the number of blue tiles to the number of white tiles is closest to  
 (A) 1:6                      (B) 2:3                      (C) 3:10  
 (D) 1:4                      (E) 1:2

