



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 12, 2004

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iAnywhere Solutions

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 10 unanswered questions.
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, to a maximum of 10 unanswered questions.

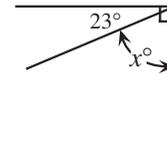
Part A: Each correct answer is worth 5.

1. The value of $\frac{10 + 20 + 30 + 40}{10}$ is
 (A) 90 (B) 91 (C) 10 (D) 64 (E) 9

2. The value of $\frac{1}{2} - \frac{1}{8}$ is
 (A) $\frac{3}{8}$ (B) $-\frac{1}{6}$ (C) $\frac{5}{8}$ (D) $\frac{1}{16}$ (E) $\frac{1}{4}$

3. Seven thousand twenty-two can be written as
 (A) 70 022 (B) 722 (C) 7202 (D) 7022 (E) 7220

4. In the diagram, the value of x is
 (A) 77 (B) 113 (C) 67
 (D) 103 (E) 90

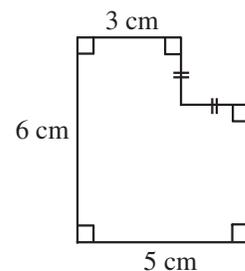


5. Five years ago today, Sally was 7 years old. In two more years, Sally will be
 (A) 12 (B) 14 (C) 9 (D) 13 (E) 10
6. At the Gauss Store, you earn 5 “reward points” for each \$25 you spend. When Stuart spends \$200 at the Gauss Store, the number of reward points that he earns is
 (A) 5 (B) 8 (C) 40 (D) 125 (E) 1000
7. Which of the following fractions has the largest value?
 (A) $\frac{8}{9}$ (B) $\frac{7}{8}$ (C) $\frac{66}{77}$ (D) $\frac{55}{66}$ (E) $\frac{4}{5}$
8. A box contains 1 grey ball, 2 white balls and 3 black balls. Without looking, John reaches in and chooses one ball at random. What is the probability that the ball *is not* grey?
 (A) 1 (B) $\frac{2}{6}$ (C) $\frac{3}{6}$ (D) $\frac{4}{6}$ (E) $\frac{5}{6}$

9. In the diagram, all rows, columns and diagonals have the same sum.
 What is the value of x ?
 (A) 12 (B) 13 (C) 16
 (D) 17 (E) 18

14	19	
	15	
x	11	

10. The perimeter of the figure, in cm, is
 (A) 30 (B) 28 (C) 25
 (D) 24 (E) 22

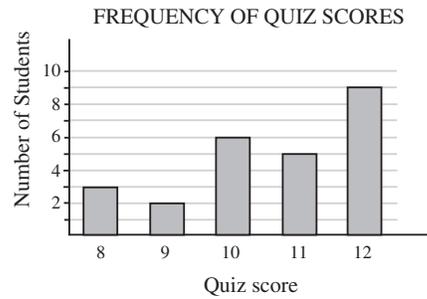


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Part B: Each correct answer is worth 6.

11. What is the median quiz score of the 25 scores shown on the bar graph?

(A) 8 (B) 9 (C) 10
 (D) 11 (E) 12



12. The elevation of Lake Ontario is 75.00 m and the elevation of Lake Erie is 174.28 m. A ship travels between the two lakes, passing through the locks of the Welland Canal. If the ship takes 8 hours to travel between the lakes, the average (mean) change in elevation per hour is
 (A) 12.41 m (B) 21.79 m (C) 5.25 m (D) 4.14 m (E) 7.80 m

13. Two positive integers have a sum of 11. The greatest possible product of these two positive integers is

(A) 11 (B) 18 (C) 28 (D) 35 (E) 30

14. How many even whole numbers lie between 3^2 and 3^3 ?

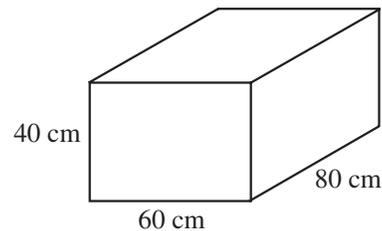
(A) 9 (B) 4 (C) 6 (D) 10 (E) 17

15. If $P = 1000$ and $Q = 0.01$, which of the following calculations gives the largest result?

(A) $P + Q$ (B) $P \times Q$ (C) $\frac{P}{Q}$ (D) $\frac{Q}{P}$ (E) $P - Q$

16. What is the maximum number of rectangular wooden blocks with dimensions $20 \text{ cm} \times 30 \text{ cm} \times 40 \text{ cm}$ that could fit into a rectangular box with inner dimensions $40 \text{ cm} \times 60 \text{ cm} \times 80 \text{ cm}$?

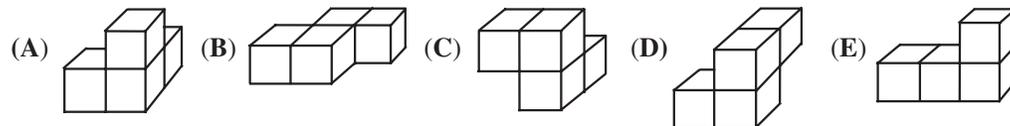
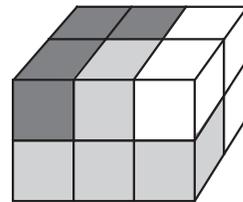
(A) 2 (B) 4 (C) 10
 (D) 8 (E) 6



17. Kalyn is trying out a new recipe that calls for 5 cups of flour and 1 cup shortening. She only has $\frac{2}{3}$ cup of shortening, and uses all of it. How much flour should she use to keep the ingredients in the same ratio as called for in the recipe?

(A) $2\frac{1}{3}$ (B) $3\frac{1}{3}$ (C) $1\frac{2}{3}$ (D) $1\frac{1}{3}$ (E) 2

18. A rectangular wooden prism is made up of three pieces, each consisting of four cubes of wood glued together. Which of the pieces below has the same shape as the black piece?



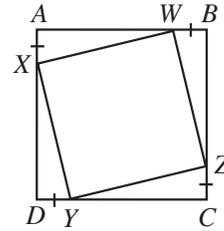
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19. A two-digit number is divisible by 8, 12 and 18. The number is between
 (A) 10 and 19 (B) 20 and 39 (C) 40 and 59 (D) 60 and 79 (E) 80 and 99

20. The area of square $ABCD$ is 64 and $AX = BW = CZ = DY = 2$.

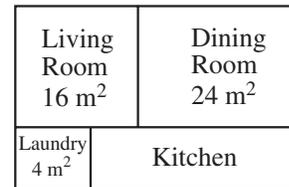
What is the area of square $WXYZ$?

- (A) 58 (B) 52 (C) 48
 (D) 40 (E) 36



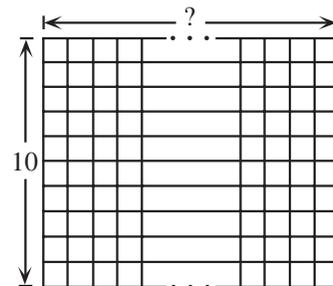
Part C: Each correct answer is worth 8.

21. In the diagram, the rectangular floor plan of the first floor of a house is shown. The living room and the laundry room are both square. The areas of three of the rooms are shown on the diagram. The area of the kitchen, in m^2 , is
 (A) 12 (B) 16 (C) 18
 (D) 24 (E) 36



22. The entire contents of a jug can exactly fill 9 small glasses and 4 large glasses of juice. The entire contents of the jug could instead fill 6 small glasses and 6 large glasses. If the entire contents of the jug is used to fill only large glasses, the maximum number of large glasses that can be filled is
 (A) 8 (B) 9 (C) 10 (D) 11 (E) 12
23. It takes Sharon one hour to drive the 59 km from her home to her office. Her drive includes 20 minutes on a highway and 40 minutes on city roads. If her average speed when she is on city roads is 45 km/h, the average speed, in km/h, at which she drives on the highway is
 (A) 42 (B) 59 (C) 87 (D) 90 (E) 100
24. In the Gauss 2004 Olympics, there are six competitors and eight events. The top three competitors in each event receive gold, silver and bronze medals respectively. (There are no ties at the Gauss Olympics, and no competitor can win more than one medal on the same event.) Each competitor scores 5 points for each gold medal, 3 points for each silver medal, and 1 point for each bronze medal. If one of the competitors had a total of 27 points, what is the maximum number of silver medals she could have won?
 (A) 6 (B) 2 (C) 3 (D) 4 (E) 5

25. A grid with 10 rows and some number of columns is made up of unit squares, as shown. A domino ($\square\square$) can be placed horizontally or vertically to exactly cover two unit squares. There are 2004 positions in which the domino could be placed. The number of columns in the grid is
 (A) 105 (B) 106 (C) 107
 (D) 108 (E) 109



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PUBLICATIONS

Please see our website <http://www.cemc.uwaterloo.ca> for information on publications which are excellent resources for enrichment, problem solving and contest preparation.