The CENTRE for EDUCATION
in MATHEMATICS and COMPUTING
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Gauss Contest

Grade 8

(The Grade 7 Contest is on the reverse side)

May 11 to May 22, 2026
(in North America and South America)

May 11 to May 22, 2026
(outside of North America and South America)

Time: 1 hour

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 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 made your choice, enter the appropriate letter for that question on your answer sheet.
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 instructs you to start, you will have *sixty* minutes of working time.

At the website cemc.uwaterloo.ca, you can find copies of past contests as well as excellent resources for enrichment, problem solving, and contest preparation.

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.

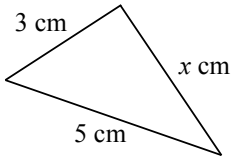
1. The mode of the list of numbers 2, 8, 2, 5, 2, 3, 2 is

   (A) 2 **(B)** 3 **(C)** 5 **(D)** 7 **(E)** 8

2. Liliana owes Abigail \$11. If she gives Abigail \$4, how much does she still owe?

   (A) \$6 **(B)** \$4 **(C)** \$11 **(D)** \$7 **(E)** \$8

3. A triangle has side lengths 3 cm, 5 cm, and x cm, as shown. If the perimeter of the triangle is 12 cm, the value of x is

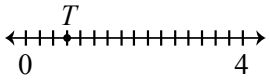


   (A) 2 **(B)** 3 **(C)** 4
   (D) 5 **(E)** 8

4. A leaking faucet drips at a rate of 1 drop every 10 seconds. How many drops will fall in 1 minute?

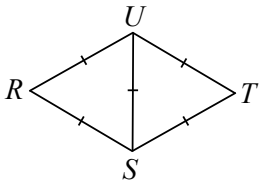
   (A) 100 **(B)** 10 **(C)** 15 **(D)** 45 **(E)** 6

5. In the diagram, the number line between 0 and 4 is divided into 16 equal parts. The number T is marked on the line. What is the value of T?



   (A) 0.8 **(B)** 1.25 **(C)** 0.75
   (D) 3 **(E)** 0.5

6. Quadrilateral $RSTU$ is formed by placing two equilateral triangles together, as shown. The measure of $\angle RST$ is



   (A) 60° **(B)** 90° **(C)** 100°
   (D) 120° **(E)** 150°

7. A grade 8 class surveyed its students to see how they get to school each day. The data collected is in the chart shown. The percentage of the students that get to school by car is

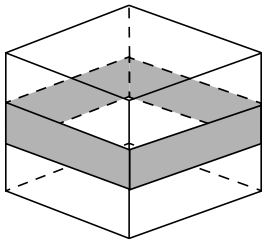
How student gets to school	Number of students
Walk	10
Bike	5
Bus	9
Car	6

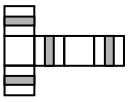
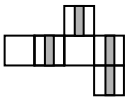
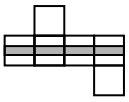
   (A) 4% **(B)** 6% **(C)** 20%
   (D) 30% **(E)** 25%

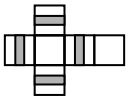
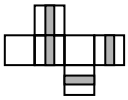
8. Livy must enter a four-digit code to unlock her phone. She knows that all four digits are different and that each digit is an integer from 0 to 9 inclusive. If she remembers the first three digits, but forgets the last digit, what is the probability that she will enter the correct code on her first try?

   (A) $\frac{1}{9}$ **(B)** $\frac{1}{7}$ **(C)** $\frac{7}{10}$ **(D)** $\frac{1}{6}$ **(E)** $\frac{1}{4}$

9. In the diagram, a shaded rectangle is drawn on each of four faces of a cube to form a band around the cube. Which of the following could *not* be the net of the cube?



(A)  **(B)**  **(C)** 

(D)  **(E)** 

10. Fatima writes the list of positive integers in order, 1, 2, 3, 4, ... and so on. The 15th positive *even* integer in the list is subtracted from the 25th positive *odd* integer in the list. The result is

(A) 15 **(B)** 17 **(C)** 19 **(D)** 21 **(E)** 23

Part B: Each correct answer is worth 6.

11. If $p + q + r = 19$ and $p + r = 8$, then the value of q is

(A) 10 **(B)** 11 **(C)** 12 **(D)** 13 **(E)** 14

12. Abel, Brock, Callie, Duan, and Edith are sitting around a circular table. Brock sits in the chair between Abel and Duan. Edith is not beside Duan. Who is sitting to Edith's immediate left and right?

(A) Abel and Callie **(B)** Brock and Duan **(C)** Abel and Brock
(D) Brock and Callie **(E)** Callie and Duan

13. The mass of a serving tray is 4 times the mass of a plate. A waiter is holding a serving tray with a stack of 6 plates on the tray. If the combined mass of the tray and the plates is 3000 g, what is the mass of each plate?

(A) 600 g **(B)** 150 g **(C)** 30 g **(D)** 500 g **(E)** 300 g

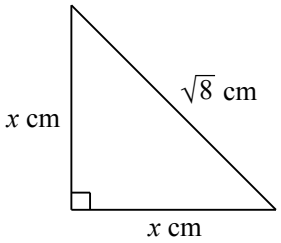
14. Anna and Yao are 42 km apart. They jog towards each other along a straight road. Anna jogs at a constant rate of 6 km/h and Yao jogs at a constant rate of 8 km/h. When they meet, how much farther has Yao travelled than Anna?

(A) 6 km **(B)** 2 km **(C)** 4 km **(D)** 21 km **(E)** 24 km

15. The height of a stack of identical newspapers is 50 cm. Half of the newspapers are removed from the stack. Then $\frac{1}{5}$ of those removed are put back onto the stack. What is the height of the stack now?

(A) 10 cm **(B)** 25 cm **(C)** 30 cm **(D)** 35 cm **(E)** 40 cm

16. In the diagram, the right-angled isosceles triangle has a hypotenuse length of $\sqrt{8}$ cm. What is the smallest number of these triangles needed to completely cover a square with side length 8 cm?



(A) 4 **(B)** 8 **(C)** 16
(D) 32 **(E)** 64

17. Each of $P4R$, $7QS$ and $TU1$ is a positive three-digit integer. The sum of $P4R$ and $7QS$ is equal to $TU1$, as shown. If each of P, Q, R, S, T, and U represents a different digit from the list $0, 2, 3, 5, 8, 9$, what is the value of U?

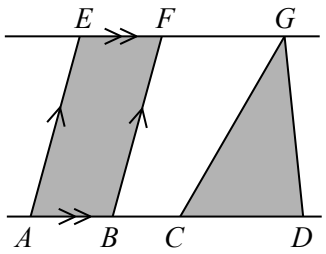
$$\begin{array}{r} P\,4\,R \\ +\quad 7\,Q\,S \\ \hline T\,U\,1 \end{array}$$

(A) 0 **(B)** 2 **(C)** 3
(D) 5 **(E)** 8

18. The Dollop sells ice cream cones. Each cone sold is exactly one of three different types: chocolate or vanilla or twist (chocolate and vanilla combined). Of all cones sold, $\frac{11}{17}$ contained some chocolate and $\frac{10}{17}$ contained some vanilla. If 85 ice cream cones were sold in total, how many were twist cones?

(A) 15 **(B)** 4 **(C)** 25 **(D)** 17 **(E)** 20

19. The line passing through the points A, B, C, and D, is parallel to the line passing through the points E, F, and G, as shown. $ABFE$ is a parallelogram and CDG is a triangle. If $AB = 8$ cm and $CD = 12$ cm, what is the ratio of the area of $ABFE$ to the area of $\triangle CDG$?



(A) 2 : 3 **(B)** 1 : 2 **(C)** 2 : 1
(D) 1 : 1 **(E)** 4 : 3

20. If each of a, b and c is a positive integer so that $a + \dfrac{1}{b + \frac{1}{c}} = \dfrac{90}{11}$, then what is the value of $a + b + c$?

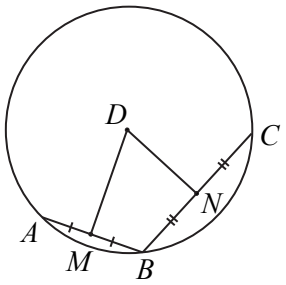
(A) 16 **(B)** 14 **(C)** 21 **(D)** 15 **(E)** 13

Part C: Each correct answer is worth 8.

21. How many possible ways can r, s and t each be assigned a different number from the list 3, 4, 5 so that the value of $r \times s + t$ is odd?

(A) 2 **(B)** 3 **(C)** 4 **(D)** 5 **(E)** 6

22. In the diagram, points A, B, C are on a circle with centre D and radius 5 cm so that $AB = 4$ cm and $BC = 6$ cm. The points M and N are the midpoints of AB and BC, respectively. Rounded to one decimal place, the area of $DMBN$ is



(A) 21.2 cm^2 **(B)** 10.6 cm^2 **(C)** 27.0 cm^2
(D) 11.4 cm^2 **(E)** 9.8 cm^2

23. A die is created with the integers $1, 2, 2, 4, 7, 8$ on its six faces. The first time the die is rolled, the numbers on its faces are changed in the following way:

    - If the number rolled is odd, then all odd numbers on the die are doubled, and all even numbers remain the same.
    - If the number rolled is even, then all even numbers on the die are halved, and all odd numbers remain the same.

    The die is then rolled a second time. What is the probability that the second number rolled is 2?

    (A) $\frac{1}{9}$ **(B)** $\frac{2}{3}$ **(C)** $\frac{1}{3}$ **(D)** $\frac{5}{18}$ **(E)** $\frac{1}{6}$

24. Serafine and Jamie are playing catch with special rules. They start by standing 1500 cm apart. One throws the ball to the other. If the ball is caught, both players each take a 60 cm step away from each other. If the ball is not caught, the person who missed the catch takes a 20 cm step towards the other player. When they stop playing catch, they are 1720 cm apart. Of the following, which number of throws is *not* possible?

    (A) 17 **(B)** 21 **(C)** 73 **(D)** 45 **(E)** 10

25. Five distinct points are located on a line. There are ten distances between pairs of points. Nine of the ten distances are 2, 3, 4, 5, 7, 9, 11, 13, 16. The remaining distance is n, and it is possible that n is equal to one of the other nine distances. If n is a positive integer from 1 to 15 inclusive, how many values of n are possible?

    (A) 1 **(B)** 2 **(C)** 3 **(D)** 4 **(E)** 5