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

Gauss Contest

Grade 7

(The Grade 8 Contest is on the reverse side)

Wednesday, May 16, 2012
(in North America and South America)

Thursday, May 17, 2012
(outside of North America and South America)

STRONGER COMMUNITIES TOGETHER™

Time: 1 hour

Calculators are permitted.

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.

Please see our Web site: http://www.cemc.uwaterloo.ca. The Gauss Report will list the names of some top-scoring students. You will also be able to find copies of past Contests and 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 value of $202 - 101 + 9$ is equal to

   (A) 120 **(B)** 110 **(C)** 111 **(D)** 109 **(E)** 92

2. Which of the following numbers is equal to 33 million?

   (A) 3 300 000 **(B)** 330 000 **(C)** 33 000 **(D)** 33 000 000 **(E)** 330 000 000

3. A six-sided die has the numbers one to six on its sides. What is the probability of rolling a five?

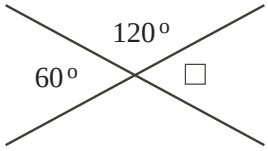
   (A) $\frac{2}{6}$ **(B)** $\frac{1}{6}$ **(C)** $\frac{5}{6}$ **(D)** $\frac{3}{6}$ **(E)** $\frac{4}{6}$

4. The largest fraction in the set $\left\{\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{10}\right\}$ is

   (A) $\frac{1}{2}$ **(B)** $\frac{1}{3}$ **(C)** $\frac{1}{4}$ **(D)** $\frac{1}{5}$ **(E)** $\frac{1}{10}$

5. Two straight lines intersect as shown.
   The measure of the angle marked $\square$ is

   (A) 60° **(B)** 120° **(C)** 30°
   (D) 300° **(E)** 180°



6. Fifteen times a number equals three hundred. The number is

   (A) 20 **(B)** 10 **(C)** 60 **(D)** 30 **(E)** 25

7. Which of the following statements is true?

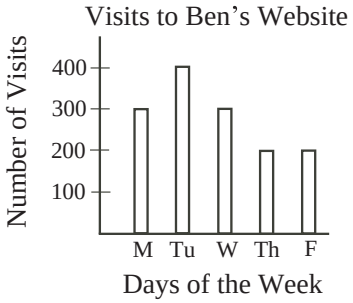
   (A) 0 is less than -5 **(B)** 7 is less than -1 **(C)** 10 is less than $\frac{1}{4}$
   (D) -1 is less than -3 **(E)** -8 is less than -2

8. Bailey scores on six of her eight shots. The percentage of shots that she *does not* score on is

   (A) 2 **(B)** 40 **(C)** 10 **(D)** 20 **(E)** 25

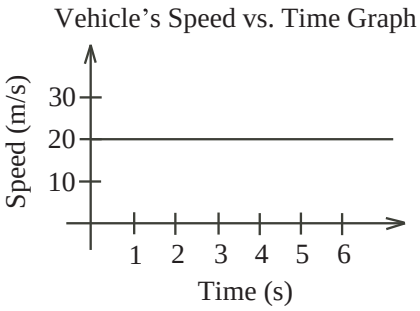
9. Ben recorded the number of visits to his website from Monday to Friday as shown in the bar graph. The mean (average) number of visits per day to his website over the 5 days is

   (A) less than 100
   (B) between 100 and 200
   (C) between 200 and 300
   (D) between 300 and 400
   (E) more than 400



10. Using the graph, the number of seconds required for a vehicle to travel a total distance of 100 m is

(A) 2.5 **(B)** 20 **(C)** 8
(D) 10 **(E)** 5



Part B: Each correct answer is worth 6.

11. The perimeter of a square is 36 cm. The area of the square, in cm^2, is

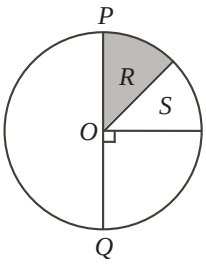
(A) 24 **(B)** 81 **(C)** 36 **(D)** 1296 **(E)** 324

12. Which of the following is *not* equal to $\frac{15}{4}$?

(A) 3.75 **(B)** $\frac{14+1}{3+1}$ **(C)** $\frac{3}{4}+3$ **(D)** $\frac{5}{4}\times\frac{3}{4}$ **(E)** $\frac{21}{4}-\frac{5}{4}-\frac{1}{4}$

13. On the spinner shown, PQ passes through centre O. If areas labelled R and S are equal, then what percentage of the time will a spin stop on the shaded region?

(A) 50% **(B)** 22.5% **(C)** 25%
(D) 45% **(E)** 12.5%



14. The digits 2, 4, 6 and 8 are each used once to create two 2-digit numbers. What is the largest possible difference between the two 2-digit numbers?

(A) 66 **(B)** 62 **(C)** 58 **(D)** 44 **(E)** 36

15. If snow falls at a rate of 1 mm every 6 minutes, then how many *hours* will it take for 1 m of snow to fall?

(A) 33 **(B)** 60 **(C)** 26 **(D)** 10 **(E)** 100

16. The number 503 is a prime number. How many positive integers are factors of 2012?

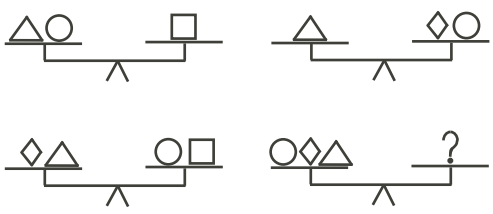
(A) 2 **(B)** 3 **(C)** 7 **(D)** 6 **(E)** 8

17. The ratio of boys to girls at Gauss Public School is 8 : 5. If there are 128 boys at the school, then how many students are there at the school?

(A) 218 **(B)** 253 **(C)** 208 **(D)** 133 **(E)** 198

18. All four scales shown are balanced.
One possible replacement for the ? is

(A) △□ **(B)** ◇△ **(C)** ○□
(D) □◇ **(E)** △○



19. A set of five different positive integers has a mean (average) of 20 and a median of 18. What is the greatest possible integer in the set?

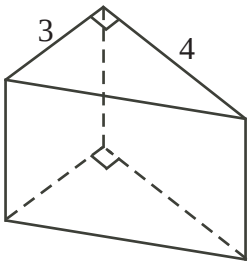
(A) 60 **(B)** 26 **(C)** 46 **(D)** 12 **(E)** 61

20. Chris lies on Fridays, Saturdays and Sundays, but he tells the truth on all other days. Mark lies on Tuesdays, Wednesdays and Thursdays, but he tells the truth on all other days. On what day of the week would they both say: "Tomorrow, I will lie."?

(A) Monday **(B)** Thursday **(C)** Friday **(D)** Sunday **(E)** Tuesday

Part C: Each correct answer is worth 8.

21. A triangular prism has a volume of 120 cm^3. Two edges of the triangular faces measure 3 cm and 4 cm, as shown. The height of the prism, in cm, is



(A) 12 **(B)** 20 **(C)** 10 **(D)** 16 **(E)** 8

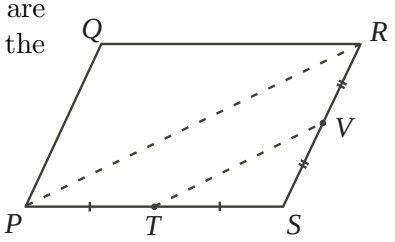
22. A quiz has three questions, with each question worth one mark. If 20% of the students got 0 questions correct, 5% got 1 question correct, 40% got 2 questions correct, and 35% got all 3 questions correct, then the overall class mean (average) mark was

(A) 1.8 **(B)** 1.9 **(C)** 2 **(D)** 2.1 **(E)** 2.35

23. The number N is the product of all positive odd integers from 1 to 99 that do not end in the digit 5. That is, $N = 1 \times 3 \times 7 \times 9 \times 11 \times 13 \times 17 \times 19 \times \cdots \times 91 \times 93 \times 97 \times 99$. The units digit of N is

(A) 1 **(B)** 3 **(C)** 5 **(D)** 7 **(E)** 9

24. $PQRS$ is a parallelogram with area 40. If T and V are the midpoints of sides PS and RS respectively, then the area of $PRVT$ is



(A) 10 **(B)** 12 **(C)** 15 **(D)** 16 **(E)** 18

25. The positive integers are arranged in rows and columns as shown below.

Row 1	1					
Row 2	2	3				
Row 3	4	5	6			
Row 4	7	8	9	10		
Row 5	11	12	13	14	15	
Row 6	16	17	18	19	20	21
			⋮			

More rows continue to list the positive integers in order, with each new row containing one more integer than the previous row. How many integers less than 2000 are in the *column* that contains the number 2000?

(A) 15 **(B)** 19 **(C)** 17 **(D)** 16 **(E)** 18