

- 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.

			Grade 7		
Se	oring: There is Each un	<i>no penalty</i> for an answered questio	n incorrect answer n is worth 2, to a	maximum of 10 u	nanswered questions.
Pa	rt A: Each co	rrect answer	is worth 5.		
1.	The value of 5 (A) 0	5 + 4 - 3 + 2 - 3 (B) $-5$	1 is (C) 3	<b>(D)</b> -3	(E) 7
2.	The value of <b>(A)</b> 5.2	$\sqrt{9+16}$ is (B) 7	(C) 5.7	<b>(D)</b> 25	<b>(E)</b> 5
3.	Students were results are sho the 10 student	surveyed about own in the bar ts surveyed chos	their favourite s graph. What pe se Spring?	eason. The rcentage of	Favourite Season $5 \neq 5$
	<ul><li>(A) 50</li><li>(D) 250</li></ul>	<ul><li>(B) 10</li><li>(E) 5</li></ul>	(C) 25		4 + 3 + 4 + 4 3 + 2 + 4 Summer Spring Winter Winter
4.	Ground beef s (A) \$5.00	ells for \$5.00 pc ( <b>B</b> ) \$12.00	er kg. How much (C) \$60.00	n does 12 kg of g ( <b>D</b> ) \$17.00	ground beef cost? (E) \$2.40
5.	The smallest <b>(A)</b> 1.0101	number in the li (B) 1.0011	ist {1.0101, 1.001 (C) 1.0110	11, 1.0110, 1.1001 (D) 1.1001	., 1.1100} is (E) 1.1100
6.	You are writing an answer at probability theorem (A) $\frac{1}{5}$	ing a multiple random. If the at you guessed (B) $\frac{5}{5}$	choice test and ere are five pose correctly? (C) $\frac{4}{5}$	on one questio sible choices (A, (D) $\frac{2}{5}$	on you guess and pick $B,C,D,E$ , what is the <b>(E)</b> $\frac{3}{5}$
7.	$\frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3}$ (A) $3\frac{1}{3}$	$+\frac{1}{3}+\frac{1}{3}+\frac{1}{3}$ eq (B) $7+\frac{1}{3}$	(C) $\frac{3}{7}$	<b>(D)</b> 7 + 3	(E) $7 \times \frac{1}{3}$
8.	Keegan paddlo of his overall t $(\mathbf{A}) \frac{1}{2}$	ed the first 12 k trip remains to ( <b>B</b> ) $\frac{5}{6}$	tem of his 36 km be completed af (C) $\frac{3}{4}$	kayak trip beforter lunch? (D) $\frac{2}{3}$	e lunch. What fraction (E) $\frac{3}{5}$
9.	If the point (3 coordinates of (A) (-4,3) (D) (3,-4)	<ul> <li><b>B</b>, 4) is reflected</li> <li><b>C</b> its image?</li> <li><b>(B)</b> (-3, 4)</li> <li><b>(E)</b> (-3, -4)</li> </ul>	in the <i>x</i> -axis, w (C) (4,3)	hat are the	y (3,4) x

- Grade 7 10. I bought a new plant for my garden. Anika said it was a red rose, Bill said it was a purple daisy, and Cathy said it was a red dahlia. Each person was correct in stating either the colour or the type of plant. What was the plant that I bought? (A) purple dahlia (B) purple rose (C) red dahlia (D) yellow rose (E) red daisy Part B: Each correct answer is worth 6. 11. In the diagram, the value of x is **(B)** 20 (C) 22 (A) 15  $2x^{\circ}$ **(D)** 18 **(E)** 36 12. A square has a perimeter of 28 cm. The area of the square, in  $cm^2$ , is (C) 64 **(D)** 49 **(A)** 196 **(B)** 784 **(E)** 56 13. Five children had dinner. Chris ate more than Max. Brandon ate less than Kayla. Kayla ate less than Max but more than Tanya. Which child ate the second most? (A) Brandon (B) Chris (C) Kayla **(D)** Max (E) Tanya
- 14. A *palindrome* is a positive integer that is the same when read forwards or backwards. For example, 545 and 1331 are both palindromes. The difference between the smallest three-digit palindrome and the largest three-digit palindrome is

(A) 909 (B) 898 (C) 888 (D) 979 (E) 878

15. A ski lift carries a skier at a rate of 12 km per hour. How many kilometres does the ski lift carry the skier in 10 minutes?

(A) 120 (B) 1.2 (C) 2 (D) 2.4 (E) 1.67

- 16. A 51 cm rod is built from 5 cm rods and 2 cm rods. All of the 5 cm rods must come first, and are followed by the 2 cm rods. For example, the rod could be made from seven 5 cm rods followed by eight 2 cm rods. How many ways are there to build the 51 cm rod?
  - (A) 5 (B) 6 (C) 7 (D) 8 (E) 9
- 17. In Braydon's cafeteria, the meats available are beef and chicken. The fruits available are apple, pear and banana. Braydon is randomly given a lunch with one meat and one fruit. What is the probability that the lunch will include a banana?
  - (A)  $\frac{1}{3}$  (B)  $\frac{2}{3}$  (C)  $\frac{1}{2}$  (D)  $\frac{1}{5}$  (E)  $\frac{3}{5}$
- 18. Three pumpkins are weighed two at a time in all possible ways. The weights of the pairs of pumpkins are 12 kg, 13 kg and 15 kg. How much does the lightest pumpkin weigh?

(A) 4 kg (B) 5 kg (C) 6 kg (D) 7 kg (E) 8 kg

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- 19. The sum of four numbers is T. Suppose that each of the four numbers is now increased by 1. These four new numbers are added together and then the sum is tripled. What is the value of this final result?

(A) 3T + 3 (B) 3T + 4 (C) 3T + 12 (D) T + 12 (E) 12T



Part C: Each correct answer is worth 8.

21. Steve begins at 7 and counts forward by 3, obtaining the list 7, 10, 13, and so on. Dave begins at 2011 and counts backwards by 5, obtaining the list 2011, 2006, 2001, and so on. Which of the following numbers appear in each of their lists?

(A) 1009 (B) 1006 (C) 1003 (D) 1001 (E) 1011

22. A pool has a volume of 4000 L. Sheila starts filling the empty pool with water at a rate of 20 L/min. The pool springs a leak after 20 minutes and water leaks out at 2 L/min. Beginning from the time when Sheila starts filling the empty pool, how long does it take until the pool is completely full?

$(\mathbf{A})$ 3 hours	(B) 3 hours 40 minutes	<b>(C)</b> 4 hours
(D) 4 hours 20 minutes $(D)$	(E) 3 hours 20 minutes $\mathbf{E}$	

23. In the addition of the three-digit numbers shown, the letters A, B, C, D, and E each represent a single digit.

$$\begin{array}{cccc}
 A & B & E \\
 A & C & E \\
 + & A & D & E \\
 \hline
 2 & 0 & 1 & 1
\end{array}$$

The value of A + B + C + D + E is

(A) 34 (B) 21 (C) 32 (D) 27 (E) 24

- 24. From the figure shown, three of the nine squares are to be selected. Each of the three selected squares must share a side with at least one of the other two selected squares. In how many ways can this be done?
  - (A) 19
    (B) 22
    (C) 15
    (D) 16
    (E) 20
- 25. Ten circles are all the same size. Each pair of these circles overlap but no circle is exactly on top of another circle. What is the greatest possible total number of intersection points of these ten circles?
  - (A) 40 (B) 70 (C) 80 (D) 90 (E) 110

