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

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Cayley Contest

(Grade 10) Tuesday, February 26, 2019

(in North America and South America)

Wednesday, February 27, 2019 (outside of North America and South America)



Time: 60 minutes

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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 response form. If you are not sure, ask your teacher to clarify it. All coding must be done with a pencil, preferably HB. Fill in circles completely.
- 4. On your response form, print your school name and city/town in the box in the upper right corner.
- 5. Be certain that you code your name, age, grade, and the Contest you are writing in the response form. Only those who do so can be counted as eligible students.
- 6. 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. After making your choice, fill in the appropriate circle on the response form.
- 7. 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. 8. Diagrams are *not* drawn to scale. They are intended as aids only.
- When your supervisor tells you to begin, you will have sixty minutes of working time.
 You may not write more than one of the Pascal, Cayley and Fermat Contests in any given year.

Do not discuss the problems or solutions from this contest online for the next 48 hours.

柳林海棠

The name, grade, school and location, and score range of some top-scoring students will be published on our website, cemc.uwaterloo.ca. In addition, the name, grade, school and location, and score of some top-scoring students may be shared with other mathematical organizations for other recognition opportunities.

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% Sco	oring: There is a Each una	no penalty for an in nswered question i	ncorrect answer s worth 2, to a	maximum of 10	unanswered questi	ons.	
mastitute 200	allusite and	Ano situtte	- 1974	itule ser	mitule Mas	Mutitute Star	mistitute
Par	t A: Each cor	rect answer is	worth 5.				
1.	The expression	$12 \times 0 + 1 - 9 \text{ eq}$	uals				
W.S.	(A) -8	(B) -6	(C) –7	(D) -11	(E) 0	A CAN	
2.	Kai will celebra	ate his 25th birth	nday in March	2020. In what	year was Kai bo	rn?	titute
THIS U.C.	(A) 1975	(B) 1990	(C) 1995	(D) 2000	(E) 1955	THISUNC	fillSU.
3. R	Yesterday, each Each student n a granola bar of these snack received each s percentage of s	n student at Cayle received either a . No student r s. The percenta mack are shown i students <i>did not</i> a	ey S.S. was give muffin, yogur received more ges of the stu n the circle gra receive a muffi	en a snack. t, fruit, or than one dents who aph. What n?	Muffin 38%	Bar the state the state of the	Institut
	(A) 27%	(B) 38%	(C) 52%	\	Yogurt Pruit 10% 27%		
W.	(D) 62%	(E) 78%	1/2 8/2	1/2 Pro	10/0	1/2 1/10	
4	The expression	$(2 \times \frac{1}{3}) \times (3 \times \frac{1}{2})$) equals	tute the starts	with me anne	the attention of the second	ature .
mstlut	(A) $\frac{1}{6}$	(B) $\frac{1}{5}$	(C) 1	(D) 5	(E) 6	mistion	fillstitue
5.	If $10d + 8 = 52$	28, then $2d$ is equ	al to				
W.	(A) 104	(B) 76	(C) 96	(D) 41	(E) 520	· · · · · · · · · · · · · · · · · · ·	
mstitut6.**	The line with or resulting line is	equation $y = x + 5$	4 is translated	d down 6 units	. The y-intercept	of the the state	mstitute
	(A) 6	(B) 4	(C) 10	(D) −6	(E) −2		
7 The three numbers 2, r and 10 have an average of r . What is the value of r^2							
All all	(A) 5	(B) 4	(C) 7	(D) 8	(E) 6	the the second s	
Milittle R.	Alain travels or to one of the p travel only right	n the 4×7 grid s points A, B, C, I at or up, and only	hown from poi D, or E. Alain along gridlines	$\begin{array}{c} \text{nt } P \\ \text{a can} \\ \text{s. To} \end{array} \xrightarrow{E} \\ \end{array}$		Institute 384	Institute
1%	which point sh	ould Alain trave	l in order to t	ravel		1 - K (40	
institute #	(A) A (D) D	(B) <i>B</i> (E) <i>E</i>	(C) C	itute the terms	mstitute ## # 2	Institute ## # 2	Institut
9.	If $(pq)(qr)(rp)$	= 16, then a pos	sible value for	pqr is	<u> </u>		
196	(A) 0	(B) 2	(C) 4	(D) 8	(E) 16	· 1/2 \$	
10. Matilda and Ellie divide a white wall in their bedroom in half, each taking half of the wall. Matilda paints half of her section red. Ellie paints one third of her section red. The fraction of the entire wall that is painted red is							
	(A) $\frac{5}{12}$	(B) $\frac{2}{5}$	(C) $\frac{2}{3}$	(D) $\frac{1}{6}$	(E) $\frac{1}{2}$		
1. A.	it is the	AT BYR	频·法 化	·····································	www. is the	· 斯米·洛州	





Cayley^{**} Contest (English) Institute # # 13 PR mutilite # # B PR mating # # 'S PE mytille # # 3 P 2019mittel # ** R itute in the The CENTRE for EDUCATION mystute # # 3 PS millitute # # # 13 PR N. in MATHEMATICS and COMPUTING tusitute # cemc.uwaterloo.ca For students... mistike # # # B Ro Thank you for writing the 2019 Cayley Contest! Each year, more 额状 than 260 000 students from more than 80 countries register to write the CEMC's Contests. Encourage your teacher to register you for the Galois Contest which multine # ** ** will be written in April. Ro institute ### Visit our website cemc.uwaterloo.ca to find • More information about the Galois Contest • Free copies of past contests 而如桃桃紫桃 • Math Circles videos and handouts that will help you learn more Ro mathematics and prepare for future contests • Information about careers in and applications of mathematics and computer science For teachers... TISTIME MAK & K Visit our website cemc.uwaterloo.ca to Ro 城林 • Register your students for the Fryer, Galois and Hypatia Contests which will be written in April • Look at our free online courseware for senior high school students • Learn about our face-to-face workshops and our web resources TURNINAL MAR HA 13 PK Ro • Subscribe to our free Problem of the Week 额状 • Investigate our online Master of Mathematics for Teachers • Find your school's contest results mutate # K & K 面射曲線新林塔梯 mythte # # '& K Astitute ## # 18 而时间推动林塔梯 Astitute the the " free Y.

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