



Grade 6 Math Circles
November 25/26, 2014
Gauss Contest Preparation

General Information

The Gauss contest is an opportunity for grade 7/8 students to have fun and challenge their mathematical problem solving skills

Date and Registration

Registration Date: April 22, 2015

Test Writing Date: May 13, 2015

Format and Marking Scheme

- 60 minutes
- 25 multiple choice questions
- 150 marks:
 - Part A: 10 questions - 5 marks each
 - Part B: 10 questions - 6 marks each
 - Part C: 5 questions - 8 marks each
 - Unanswered Questions: 2 marks each (for up to 10 questions)

Solutions to each question will be posted to:

http://cemc.math.uwaterloo.ca/events/mathcircle_presentations.html

Contest Success Strategies

- **ELIMINATE** - choices that aren't sensible answers, making it easier to guess
- **DRAW** - diagrams representing your scenario to help clear up misconceptions
- **MOVE ON** - from questions you are stuck on to get as many marks as possible
- **FOCUS** - on Part B and Part C questions as Part A shouldn't pose a challenge
- **PRACTICE** - by studying from the contest bank on the CEMC website
- **LEARN** - techniques and short-cuts from past contest solutions

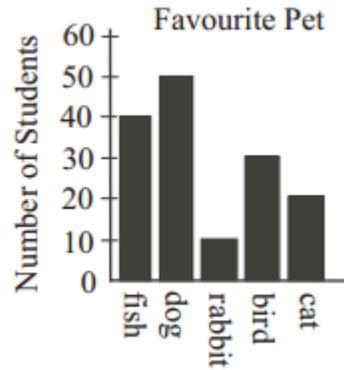
Scoring:	There is <i>no penalty</i> for an incorrect answer. Each unanswered question is worth 2, to a maximum of 10 unanswered questions
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The next pages are a mock test. There are 17 questions, 7 in part A, 7 in part B and 3 in part C. You have 35 minutes for this mock test, if you finish early there are 8 extra problems at the end to keep you busy.

Part A: Each correct answer is worth 5.

1. (2008 Q1) The value of $-3 \times 2 + 7$ is
 (A) -27 (B) 1 (C) 13 (D) -1 (E) -13

2. (2010 Q1) Students were asked what is their favorite pet. Given the Graph to the right how many students chose bird.

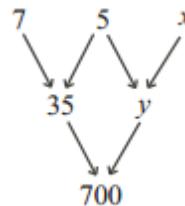


- (A) 10 (B) 20 (C) 30
 (D) 40 (E) 50

3. (2006 Q3) If Timmy has \$5000 in \$20 dollar bills, how many \$20 bills does he have?
 (A) 500 (B) 100 (C) 2500 (D) 250 (E) 1000
4. (2011 Q4) At the store the price for beef is \$10 per 2 pounds. If you want to buy 5 pounds it will cost you.
 (A) 50 (B) 25 (C) 13 (D) 30 (E) 5
5. (2009 Q6) It is 19° in Florida. In Vancouver it is 13 degrees cooler and than Florida. In Calgary it is 9 degrees cooler then in Vancouver. What is the temperature in Calgary.
 (A) 2° (B) 0° (C) 10° (D) 6° (E) -3°
6. (2011 Q8) Tommy is running a marathon(42 Km) an hour in he passes the 14 km marker. How much of the race does he have left?
 (A) $\frac{2}{4}$ (B) $\frac{1}{3}$ (C) $\frac{4}{5}$ (D) $\frac{2}{3}$ (E) $\frac{3}{4}$

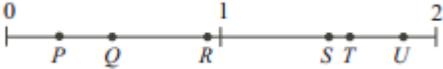
7. (2010 Q10) Each number below the top row is the product of the number to the right and the number to the left in the row immediately above it. What is the value of x ?

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



Part B: Each correct answer is worth 6.

8. (2007 Q11) A a Fibonacci number is a number that falls in the pattern: 1, 1, 2, 3, 5, 8, ... Each number in this patter is found by adding the two numbers before it. Knowing this which of the following numbers is a Fibonacci number?
 (A) 33 (B) 22 (C) 20 (D) 34 (E) 27

9. (2012 Q11) The perimeter of a square is 36 cm. The area of the square, in cm^2 , is
 (A) 81 (B) 24 (C) 324 (D) 1296 (E) 36
10. (2007 Q12) A lottery is held and 180 tickets are sold. How many tickets did Sam buy if he has a probability of winning of $\frac{1}{30}$
 (A) 5 (B) 6 (C) 7 (D) 8 (E) 9
11. (2009 Q14) Which of the points positioned on the number line best represents the value of $S \div T$?
 (A) R (B) T (C) U
 (D) Q (E) P
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12. (2012 Q14) The digits 3, 4, 7 and 9 are each used once to create two 2-digit numbers. What is the largest possible difference between the two 2-digit numbers?
 (A) 46 (B) 64 (C) 57 (D) 54 (E) 63
13. (2013 Q16) The average of 7 consecutive numbers is 23. What is the largest of these number?
 (A) 23 (B) 24 (C) 25 (D) 26 (E) 27
14. (2012 Q17) The ratio of boys to girls at Gauss Public School is 7 : 4. If there are 112 boys at the school, then how many students are there at the school?
 (A) 154 (B) 308 (C) 196 (D) 64 (E) 176

Part C: Each correct answer is worth 8.

15. (2008 Q18) Billy wrote 4 of 5 tests so far this year and got marks of 77,75,86,84. Each test is worth the same amount and is scored from 0-100. Which of the following is a possible average after he writes his fifth and final test.
 (A) 50 (B) 63 (C) 84 (D) 85 (E) 90

16. (2010 Q22) An arithmetic sequence is a sequence in which each term after the first is obtained by adding a constant to the previous term. For example, 2, 4, 6, 8 and 1, 4, 7, 10 are arithmetic sequences. In the grid shown, the numbers in each row must form an arithmetic sequence and the numbers in each column must form an arithmetic sequence. The value of x is
 (A) 22 (B) 32 (C) 42
 (D) 39 (E) 34

0			
4			25
8			x
		30	

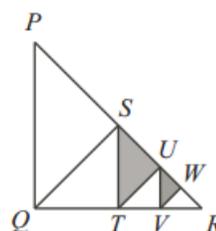
17. (2006 Q23) In the addition of two 2-digit numbers, each blank space, including those in the answer, is to be filled with one of the digits 0, 1, 2, 3, 4, 5, 6, each used exactly once. The units digit of the sum is
 (A) 5 (B) 4 (C) 3
 (D) 2 (E) 1

$$\begin{array}{r}
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 \end{array}$$

Extra Problems:

- (2009 Q3) How many prime numbers are in the list: 31, 32, 33, 34, 35, 36, 37, 38, 39
 (A) 0 (B) 1 (C) 2 (D) 3 (E) 4
 - (2006 Q7) What is the value of x in $-2+6x = 40$
 (A) 5.5 (B) 4 (C) 7 (D) 5 (E) 6
 - (2012 Q7) Which of the following statements is true?
 (A) -5 is less than -8 (B) 4 is less than 2 (C) 0 is less than -8
 (D) -7 is less than -4 (E) -3 is less than -6
 - (2006 Q11) If a soccer ball costs 19.99 before tax and there is a 15% sales tax, how much does the ball cost with the tax included.
 (A) 21.49 (B) 3.00 (C) 22.99 (D) 21.50 (E) 20.14
- 2
- (2007 Q15) How many positive whole numbers, including 1, divide exactly into both 30 and 75?
 (A) 1 (B) 2 (C) 3 (D) 4 (E) 5
 - (2011 Q17) It's lunchtime! You are given one drink, either apple juice, orange juice or milk. You are given one meal either chicken or vegetarian. Finally you get either an apple, an orange or a banana. If you are given a meal at random what is the probability that you get apple juice in your meal?
 (A) $\frac{1}{6}$ (B) $\frac{1}{2}$ (C) $\frac{2}{3}$ (D) $\frac{1}{3}$ (E) $\frac{5}{6}$
 - (2010 Q23) Johnny assigns a different value to each letter in the alphabet. Each word then has a score which is the product of the letters in that word. If BOB has a value of 36, ROB has a value of 30 and ROW has a value of 24, what is that value of BORROW?
 (A) 780 (B) 720 (C) 500 (D) 600 (E) 640

- (2006 Q23) (2013 Q23) In the figure, each line through the triangles cuts them in half. That is the large triangle made by the points PQR, is split in half by the line that goes from Q to S. Similarly the triangle QSR is cut in half by the line going from S to T. The same applies to the smaller triangles. what fraction of the large triangle PQR is shaded.



- (A) $\frac{3}{16}$ (B) $\frac{3}{8}$ (C) $\frac{5}{16}$
 (D) $\frac{5}{32}$ (E) $\frac{7}{32}$