



Grade 6 Math Circles

Mar.28th, 2012

Introduction to the Caribou Mathematics Competition

Most of you may be doing this already in your schools. The **Caribou Mathematics Competition** is a free, online math contest administered by Brock University geared towards grades 3-8 students. For more information and practice contests, visit: <http://www.brocku.ca/caribou/>

It is a series of 6 Canada wide contests written throughout the school year. (The next one this year is on April 18th, 2012). Contests are provided in both English and French. It is done on the computer under the supervision of a staff or librarian in the school to ensure fairness in the contest.

The time limit for the contest is 1 hour. The grade 5-6 level usually consists of 18 questions. A student's overall standing is calculated by his/her accumulative score over the 6 contests. (A missed contest is given score 0, so be sure to make an effort to attend all 6 contests)

All problems are multiple choice, usually with 4 to 7 possible answers, only one of them is correct. If your answer isn't one of the answers given, then **YOU ARE PROBABLY WRONG**.

Math contests should be an enjoyable, fun experience. They invigorate your mind and train your creative and organized thinking. Don't worry about winning or losing or looking smart. The most important thing is to **LOVE IT WHEN YOU ARE DOING IT!**

Some strategies include:

- Read the question a reasonable number of times (as needed) to fully understand what's given to you and what it's asking you.
- If you start on a question and have no idea where to even begin or the question just doesn't seem to make sense, you are probably wasting your time on this question. Go to the next problem.
- Try to start by relating a problem to types of similar problems you've done before, and relate the approaches to solve the problem.
- Don't just think, jot things down, scribble if you have to. These help your mind to make sense and create a flow of thought.
- After you are done, come back if you have time and look at your answers. Check for any silly mistakes (an answer is likely to be a silly mistake if it doesn't make sense to you what-so-ever).
- PRACTICE LOTS, LOTS and LOTS!

Mock Contest

**Disclaimer: I do not own any of the problems posted below. All problems are at the courtesy of Brock University and the organizers of the Caribou Mathematics Competition.

Instructions:

- You have 1 hour to finish this.
- Don't cheat off other people around you.
- In case you didn't know, for questions with "?" in the middle of the question, the "?" is where the correct answer should go.
- I will only answer questions that are fair (i.e. I will not help you do a problem)
- Feel free to use a calculator, although most of the times you don't need to.
- Have fun!

1. Each year your birthday is on a different day of the week. How many days should a year have so that the birthday is always on the same week day?
363 364 366 367 368
2. If 84 players split themselves into teams, how many more teams can they form by splitting into teams of 4 instead of teams of 6?
5 6 7 14 9
3. Uncle Rat eats two books a week; Aunt Rat eats one book every two months. In a year, Uncle eats ? more books than Aunt. (Assuming that there are 52 weeks in a year)
20 40 80 98 18
4. A caribou runs over the tundra. He passes ravens (black birds) and polar bears. He sees three times as many ravens as polar bears. Which of the following could be the total number of feet he saw? (Note: A raven has 2 feet)
16 18 20 23 24
5. 7 is prime, so May 7th is a "prime" day. In all, May has ? "prime" days.
10 11 12 13 14 15 16
6. In a rectangle with perimeter 60 cm and area 81cm^2 , the longer side's length is ? cm more than that of the shorter side.
0 21 42 24 12
7. Of the whole numbers 10, 11, ..., 98, 99, how many are greater than the sum of their digits?
88 89 90 99 80

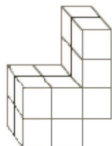
8. You are near a creek and you have two buckets, of 15 and 16 liter respectively. The buckets have no scale and no labels. Find a way to get 3 liter in one bucket. At least how often does one have to pour water from one bucket into the other one to achieve that?
2 3 4 5 6
9. There are 10 red and 10 blue balls in a box. Tom takes them out one by one without looking and puts them on the floor. How many balls does he need to take out at most to be sure that he has two of the same color on the floor?
2 3 10 11 20
10. Mike caught three times as many fish as Nick. They caught a total of 12 fish. How many more fish did Mike catch than Nick?
2 3 4 5 6 1 7
11. A picture is three times as tall as it is wide. A piece of framing material 240 cm long is to be used. If the width of the picture frame is 10 cm, how many picture frames can be made?
3 24 8 12 5 6 4
12. $0.09\% = 0.1\% - ?$
1% 10% 0.1% 0.01% -0.8% 0.08% -0.1%
13. Emma hikes away from a campsite and back with a bottle of water. She drinks 20 mL after 1 km, another 40 mL after hiking the second kilometre, another 60 mL after hiking the third kilometre and so on. The bottle holds 600 mL. What is the furthest she can go from the campsite if she drinks in this way? (After the last km back at the campsite she can drink something else.)
4km 8km 6km 5km 7km 3km 9km
14. Alice and Bob are discussing their plans for this evening when school is over.
"After dinner I'm going to do my math homework," said Alice. "Either that, or I will watch my favourite TV program, Dancing with the Mathematical Stars."
"Will you do both?" asked Bob.
"Oh, no," replied Alice, "there's not enough time to do both. But I will do one of them for sure."
Which of the following statements about Alice's activities this evening is sure to be true?
- Alice will do her math homework and also watch Dancing with the Mathematical Stars.
 - Alice will do her math homework but not watch Dancing with the Mathematical Stars.
 - Alice will not do her math homework but will watch Dancing with the Mathematical Stars.
 - If Alice does not do her math homework then she will watch Dancing with the Mathematical Stars.
 - We can't be sure that any of the other statements is true for sure.
15. To knit a square 6 cm on each side takes 4 balls of wool. How many balls are needed to knit a square 12 cm on each side?
10 12 32 16 8 24 20

16. $17 \times 19 = 9 \times 19 + ? \times 19 + 19 \times 4$
 3 4 17 6 -6

17. Elves and dwarfs live on one island together. Dwarfs never tell the truth, and the elves never lie. One day 15 of the inhabitants of the island formed a circle and everyone in the circle claimed that one of their neighbors was a dwarf and the other was an elf. Which of the following are possible numbers for elves and dwarfs?

- 11 elves and 4 dwarfs
- 10 elves and 5 dwarfs
- 6 elves and 9 dwarfs
- 5 elves and 10 dwarfs
- 4 elves and 11 dwarfs
- 9 elves and 6 dwarfs
- 3 elves and 12 dwarfs

18. The following figure is made up of 14 cubes. What is the surface area of the object?



- 42 40 38 48 70 56 32

19. Of the following, which is the first time after 4:30 that the minute and hour hands of my circular alarm clock no longer form an acute angle?

- 4:36 4:37 4:38 4:39 4:40 4:35 4:41

20. You toss three coins at the same time. What is the probability of getting either 3 heads or 3 tails?

- $\frac{1}{8}$ $\frac{3}{8}$ $\frac{1}{3}$ $\frac{1}{4}$ $\frac{3}{6}$

...End of Mock Test