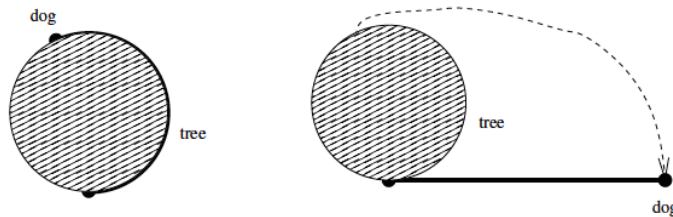


## EDITORIAL

Canadians live in the world's most educated country: according to the Organization for Economic Cooperation and Development, Canada tops the charts with 54% of population having tertiary education. And this is up from 40% in year 2000. Of course, highly educated immigrants contribute to these figures, but it is not the only explanation. Canada also confers more bachelors degrees per capita than any other country. So no wonder that this is where you will find some of the most avid problem solvers and many sources of interesting problems to puzzle over.

From East to West, nearly every university in the country runs undergraduate contests for their students. To entice the unsuspecting and the amenable undergraduates into mathematics, these contests often offer unusual problems. Here are two examples from two universities on either coast.

1. A dog is tied to a tree trunk of radius 1 by a rope of length 10 attached at a fixed point on the trunk of the tree. The rope is initially taut and fully wound around the trunk. The dog runs around the tree unwinding the rope and keeping the rope taut until the rope is tangential to the tree trunk. This is illustrated (not to scale) in the figures below: the left panel shows the initial position and the right panel shows the final position, with the thick line representing the rope and the dashed line representing the path of the dog.



What is the total distance run by the dog? As indicated in the figure, you should assume that all motion takes place in the horizontal plane. (University of Victoria Mathematics Competition 2013.)

2. Let  $ABCD$  be an isosceles trapezoid with  $|AB| = |CD| = F_n$ ,  $|BC| = F_{n-1}$  and  $|AD| = F_{n+1}$ , where  $F_k$  are the Fibonacci numbers  $F_1 = F_2 = 1$ ,  $F_{k+1} = F_k + F_{k-1}$ . Find the area of the trapezoid and express it in terms of a single Fibonacci number. (Memorial University of Newfoundland Undergraduate Mathematics Competition 2009.)

Although this country covers nearly 10 million square kilometres, you can always find a mathematical inspiration nearby. Participate in these events and contribute to them to keep generations of problem solvers entertained.

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