ROUND #1

Gainesville State College
Mathematics Tournament
April 10, 2010

The area of a sector of a circle with central angle of $\frac{\pi}{12}$ radians is $\frac{1}{x}$ of the area of that circle. What is the value of x?

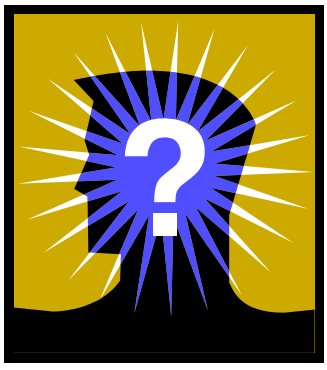
ROUND #2

Gainesville State College
Mathematics Tournament
April 10, 2010

Find the area of the figure enclosed by connecting the points

$(1,0)$, $(5,3)$, $(7,0)$, $(7,4)$, $(6,10)$, $(4,8)$, $(0,10)$, $(3,6)$, and $(1,0)$

in the order they appear in the above list.



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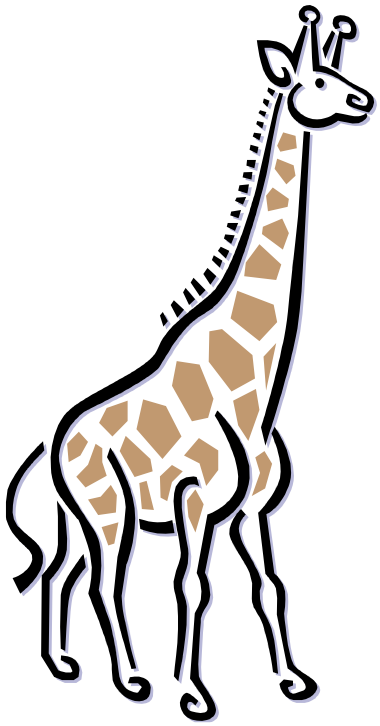
ROUND #3

Gainesville State College
Mathematics Tournament
April 10, 2010

A giraffe is in a fenced corral in the shape of a right triangle. One leg of the triangle is 10 *meters*, and the hypotenuse is 20 *meters*. Thanks to its long neck, the giraffe can eat greens not only inside of the corral, but also outside, up to 3 *meters* from the fence. What is the total area of feeding available for the giraffe?
Give the approximation to three decimal places.



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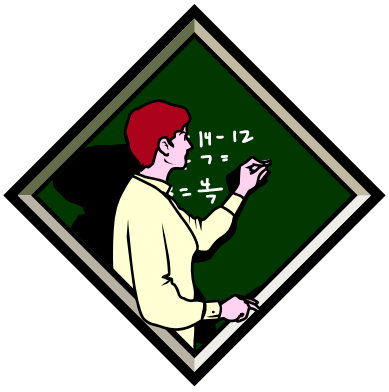
ROUND #4

Gainesville State College
Mathematics Tournament
April 10, 2010

An ***arithmetic sequence*** is a sequence of numbers (called ***terms***) such that the difference between any two consecutive terms is a constant.

How many ***terms*** are there in the following arithmetic sequence?
3, 5.7, 8.4, 11.1, …, 858.9, 861.6, 864.3, 867



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ROUND #5

Gainesville State College
Mathematics Tournament
April 10, 2010

A wire is cut into 2 pieces of distinct lengths. The first piece is bent into an equilateral triangle. The second piece of length $2\sqrt{3}$ *cm* is used as a perpendicular height for this triangle.

Find the length of the first piece.

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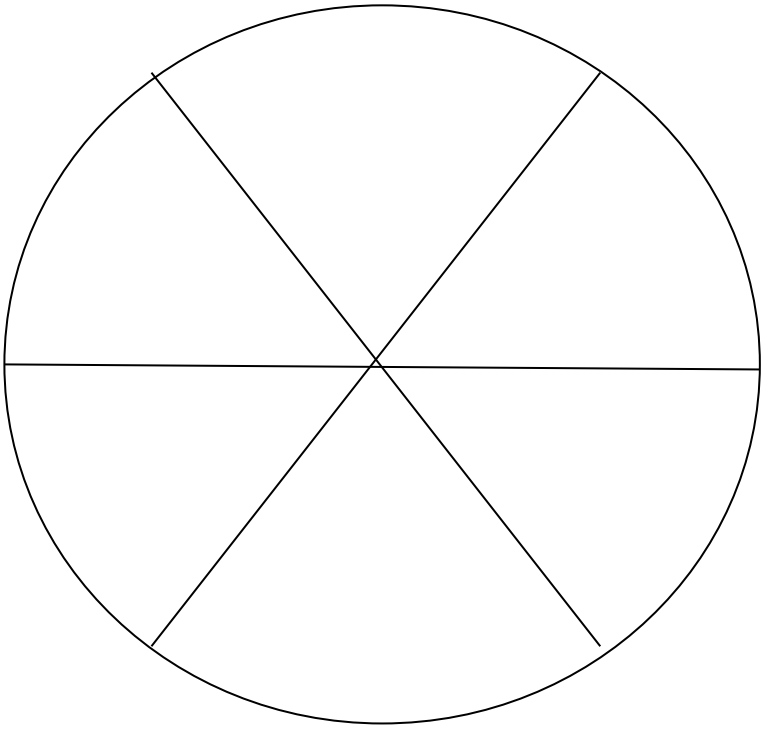
ROUND #6

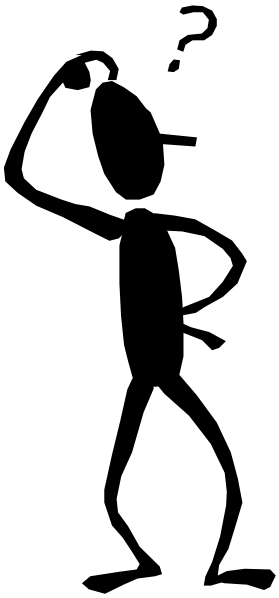
Gainesville State College
Mathematics Tournament
April 10, 2010

If a wheel revolves $1\frac{5}{6}$ revolutions per minute, how many degrees does it revolve in one second?



ROUND #7

Gainesville State College
Mathematics Tournament
April 10, 2010



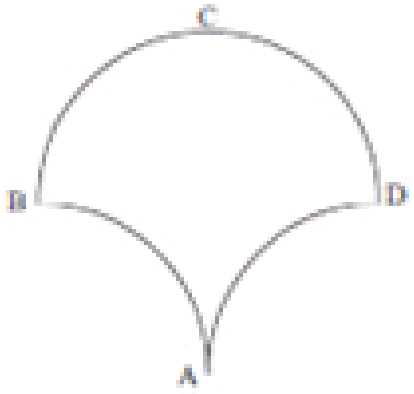
Find all values of x (in radians) between 0 and $\frac{\pi}{2}$ such that $\left(2^4\right)^{\sin^2 x} + \left(2^4\right)^{\cos^2 x} = 10$.

Provide exact answers written in terms of π.

ROUND #8

Gainesville State College
Mathematics Tournament
April 10, 2010

Three circular arcs of radius 5 *units* bound the plane region shown. Arcs AB and AD are quarter-circles, and arc BCD is a semicircle. What is the area, in *square units*, of the (plane) region?



ROUND #9

Gainesville State College
Mathematics Tournament
April 10, 2010

An apple, an orange, a banana, and a pear are laid out in a straight line. The orange is not at either end and is somewhere to the right of the banana. In how many ways can the four pieces of fruit be laid out?

ROUND #10

Gainesville State College
Mathematics Tournament
April 10, 2010

Today, I am twice as old as you were when I was as old as you are today.

Today, our ages added together make 63.

How old is each of us?