ROUND #6

Gainesville College
Mathematics Tournament
For Two-Year Colleges
April 2, 2005

There are 10 horizontal lines and 7 vertical lines in the plane.

How many rectangles do they create?

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ROUND #7

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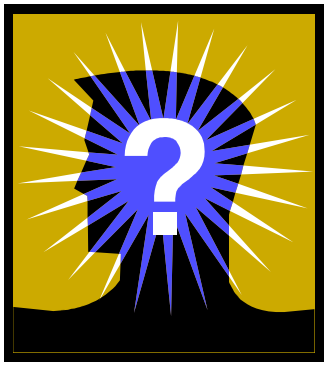
Suppose that $g(x) = 1 + \sqrt{x}$. Find f such that $f\left(g(x)\right) = 3 + 2\sqrt{x} + x$.



ROUND #8

Gainesville College
Mathematics Tournament
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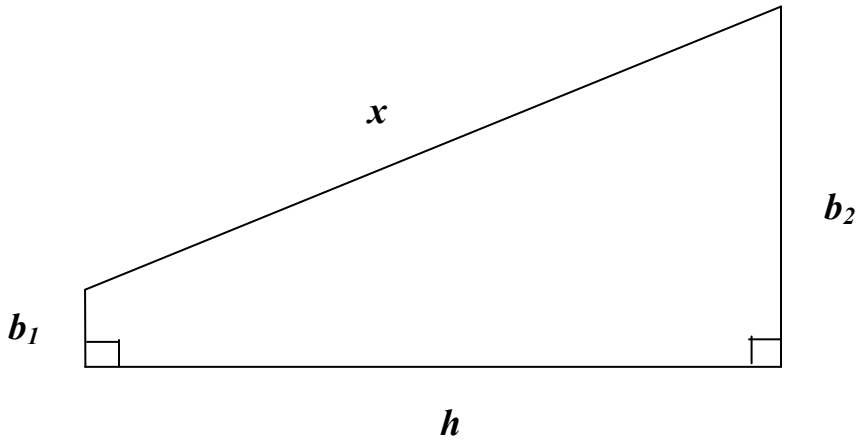
Suppose a ramp has a trapezoidal cross section as shown with base, $b_1 = 0.5\ ft$, such that $b_1 : b_2 = 1{:}13$. Find the length x (in feet) of the ramp if the area of the cross section is $28\ ft^2$.



ROUND #9

Gainesville College
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A book has pages numbered starting with 1. To number the pages, a total of 3293 digits were used. What is the last page number?

ROUND #10

Gainesville College
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Find the exact value: $\cos\left(\sin^{-1}\left(\tan\left(\cos^{-1}\left(\sin\left(\tan^{-1}\left(\frac{4}{3}\right)\right)\right)\right)\right)\right)$