Re: Geometry with right triangle..

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- *From*: mitch.nicolas.raemsch@xxxxxxxxx
- *Date*: Thu, 1 May 2008 14:44:05 −0700 (PDT)

On May 1, 10:33 am, bill <b92...@xxxxxxxxx> wrote:

> On Apr 30, 10:34 pm, "mina_world" <mina_wo...@xxxxxxxxxxx> wrote:
>
>> Hello teacher~
>>
>> The perimeter of a right triangel ABC is 2a.
>>
>> Find the scope of hypotenuse x.
>>
>> Answer : 2{sqrt(2) − 1}a <= x < a.
>>
>> −−
>> Ok, let's go...
>>
>> hypotenuse : x
>> base : c
>> altitude : d
>>
>> c + d + x = 2a
>> c^2 + d^2 = x^2
>> c + d > x

(i) If x >= a, then c + d = 2a − x <= a <= x.
contradiction.

(ii) By Cauchy−Schwarz inequality,
(c + d)^2 <= (1^2 + 1^2)(c^2 + d^2)
so, (c + d)^2 <= 2.(x^2)
so, (2a − x)^2 <= 2.(x^2)
so, 2.(x^2) − (2a − x)^2 >= 0
so, 2.(x^2) − [4a^2 − 4ax + x^2] >= 0
so, x^2 + 4ax − 4a^2 >= 0
so, x <= 2a{−1 − sqrt(2)} , x >= 2a(−1 + sqrt(2)}

so, 2{sqrt(2) − 1}a <= x < a.

x is minimun when c+d is maximum.
Guessing that c+d is maximum when
c = d; we surmise that

2*c^2 = x^2 Then
Sqrt(2)*c = x = sqrt(2)*d
c = x/sqrt(2) = d
2*a = x/sqrt(2) + x/sqrt(2) +x
= sqrt(2)*x + x
2*a = x*(1 +sqrt*2)
2*a/[1 +sqrt(2)] < = x

Bill J− Hide quoted text −

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