Tough Integrals & A Strange Distribution

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Hi all,

here a simple but difficult question:
Does the following probability density in x and y

f(x,y) = C(a,b) *
((1 + a*(x^2+y^2)) * (1 + b*(x^2+y^2))^(−1)

represents a special form of a bivariate Student−t distribution?
Above, a,b>0 and C(a,b)=ln(a/b) is the normalization constant.
For the special case a=b, it it easily seen that f(x,y) is
bivariate t (with 2 degrees of freedom);

...if a is different from b, is it still a t−distribution ??

I'm asking because I want to compute the two−fold
probability integral P(x<X,y<Y). The first integration is not
too diffult, but the second seems impossible. It would be good
to know wether mathematicians have already defined the spherical
density from above.

Here some forms the integrals to be solved can have:

1) int ln(sin^2(x) + a) dx

2) int arctan(x) / (x*sqrt(1−x)) dx

3) int 1/sqrt(1+x^2) * arctan(1/sqrt(1+x^2)) dx

Using Maple on 1) the gives a looooong and unpleasant result
in terms of the dilogarithm, not very helpful at all...

Any help is welcome!
Christian.