

3. [5 points] Let

$$j(x) = \ln(x^2 + 1).$$

Use the limit definition of the derivative to write an explicit expression for $j'(7)$. *Your answer should not involve the letter j . Do not attempt to evaluate or simplify the limit.* Write your final answer in the answer box provided below.

Answer: $j'(7) =$

4. [4 points] Consider the family of circles defined by the equations

$$(x - a)^2 + y^2 = r^2,$$

where a and r are parameters with $r > 0$. Jessie draws a circle from this family that passes through $(0, 10)$ with a slope of $-\frac{1}{2}$. Find the exact value of both parameters a and r for Jessie's circle. *Show your work.*

Answer: $a =$ _____ and $r =$ _____