MAT2500-05 22f Quiz 5 Print Name (Last, First) _____|_
Show all work, including mental steps, in a clearly organized way that speaks for itself. Use proper mathematical notation, IDENTIFYING expressions by their proper symbols (introducing them if necessary), and use EQUAL SIGNS and arrows when appropriate. Always SIMPLIFY expressions. BOX final short answers. LABEL parts of problem. Keep answers EXACT (but give decimal approximations for interpretation if appropriate). Indicate where technology is used and what type (Maple, GC). Only use technology to CHECK hand calculations, not substitute for them.

1. $f(x, y) = \ln\left(\dfrac{10 + \sqrt{x^2 + y^2}}{10 - \sqrt{x^2 + y^2}} \right)$. Evaluate $f_x(x, y)$ and its value at $(3, 4)$, identifying each by their proper symbols. [Check your work with Maple!]

2. The wave heights h in open sea depend on the speed v of the wind and the length of time t that the wind has been blowing at that speed. Values of the function $h = f(v, t)$ are recorded in feet in the table.

(a) What is the value of $f(50, 30)$? What is its meaning in words (a complete sentence)?
(b) For what value of h is $f(50, t) = 29$? Formulate this question in words.
(c) What is the meaning of the function $h = f(v, 30)$?

Duration (hours)

v \ t	5	10	15	20	30	40	50
10	2	2	2	2	2	2	2
15	4	4	5	5	5	5	5
20	5	7	8	8	9	9	9
30	9	13	16	17	18	19	19
40	14	21	25	28	31	33	33
50	19	29	36	40	45	48	50
60	24	37	47	54	62	67	69

Wind speed (knots)

▶ **solution**