Question 1

Which of the following figure gives the level curves of $f(x, y) = x - y$?
Which of the following figure gives the level curves of \( f(x, y) = x^2 + 4y^2 \)?

A

B

C

D
Evaluate the following limit

\[ \lim_{(x,y) \to (0,0)} \frac{x^2 + 1}{\sqrt{x^2 + y^2 + 2}}. \]

A. 0  
B. \( \frac{1}{\sqrt{2}} \)  
C. 1  
D. \(+\infty\)  
E. Limit D.N.E.
Evaluate the following limit

\[
\lim_{{(x,y) \to (0,0)}} \frac{{(x + y)^2 - (x - y)^2}}{xy}.
\]

A. 0  
B. 1  
C. 2  
D. 4  
E. Limit D.N.E.
Evaluate the following limit

\[
limit_{(x,y) \to (0,0)} \cos \left( \frac{1}{x^2 + y^2} \right).
\]

A. \(-1\)
B. 0
C. \(\frac{1}{2}\)
D. 1
E. Limit D.N.E.