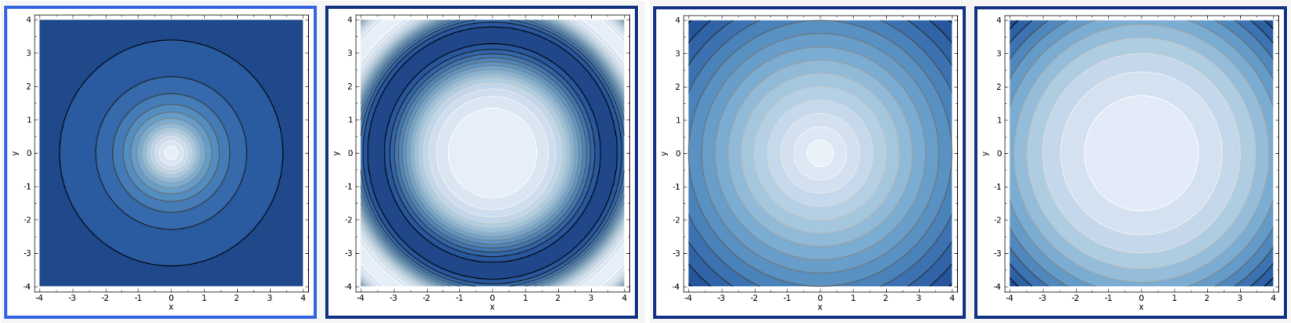
MATH 2551-GT-E– Multivariable Calculus **Summer 2025**

Full name: Key **GT ID:**_____ **Sec:**____

Quiz 3 Version A

You have 15 minutes to take the quiz. No phones, notes, or use aids of any kind is permitted.

1. (2 points) Match each function with its contour plot by writing the letter in the box. Darker areas represent lower elevations and lighter areas represent higher elevations. [A]



A B C D

D $f(x,y) = 3 - x^2 - y^2$

B $f(x,y) = \cos\left(\dfrac{x^2+y^2}{4}\right)$

A $f(x,y) = \dfrac{1}{1+x^2+y^2}$

C $f(x,y) = 3 - \sqrt{x^2+y^2}$

2. (8 points) **[Limits and Continuity]**
Evaluate the limit. *Hint: use algebra.* [AJN]

$$\lim_{(x,y)\to(0,1)} \frac{\sqrt{y-x}-1}{y-x-1}$$

$$\lim_{(x,y)\to(0,1)} \frac{\sqrt{y-x}-1}{y-x-1} = \lim_{u\to u} \frac{\sqrt{y-x}-1}{y-x-1} \cdot \frac{\sqrt{y-x}+1}{\sqrt{y-x}+1} = \lim_{u\to u} \frac{y-x-1}{(y-x-1)(\sqrt{y-x}+1)}$$

$$= \lim_{(x,y)\to(0,1)} \frac{1}{\sqrt{y-x}+1} = \frac{1}{\sqrt{1-0}+1} = \frac{1}{1+1} = \boxed{\frac{1}{2}}$$