

Last Name: SOLUTIONS

First Name: _____

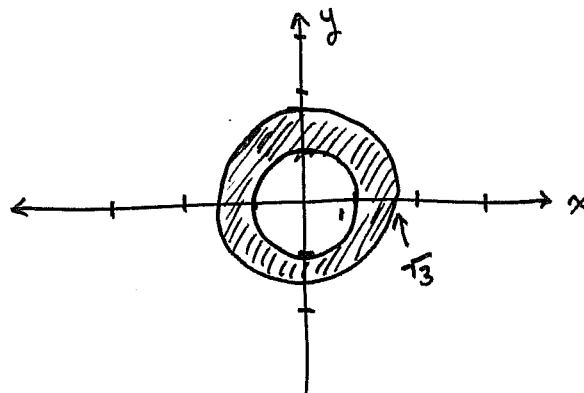
Student ID: _____

Quiz 6

Question 1. (4 marks) Find and sketch the domain of the function $f(x,y) = \arcsin(x^2 + y^2 - 2)$.

$$-1 \leq x^2 + y^2 - 2 \leq 1 \iff 1 \leq x^2 + y^2 \leq 3$$

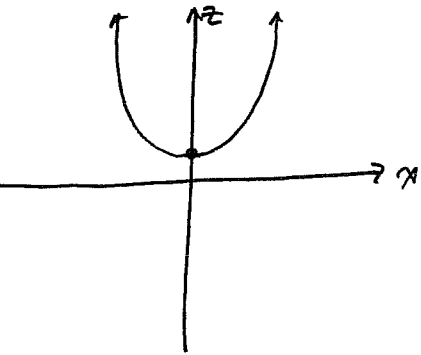
$$\therefore D = \{ (x,y) \mid 1 \leq x^2 + y^2 \leq 3 \}$$



Question 2. (6 marks) Sketch the intersection of the surface $f(x,y) = 1 + 2x^2 + 2y^2$ and xz -plane, the intersection with the yz -plane and the intersection with the $z = 9$ plane. Use these sketches to sketch the graph of $f(x,y) = 1 + 2x^2 + 2y^2$.

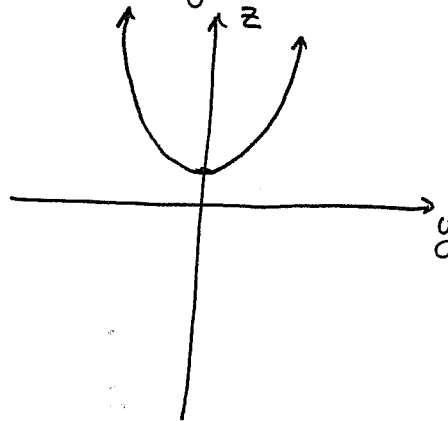
xz -PLANE: $y = 0$

$$\therefore z = 1 + 2x^2$$



yz -PLANE: $x = 0$

$$\therefore z = 1 + 2y^2$$



$z = 9$ PLANE

$$9 = 1 + 2x^2 + 2y^2$$

$$8 = 2x^2 + 2y^2$$

$$4 = x^2 + y^2$$

