


Problem 5. (10 points.) Let S be the part of the paraboloid $z + x^2 + y^2 = 4$ lying between the planes $z = 0$ and $z = 1$. For each of the following, indicate with a **yes** or a **no** whether it correctly parameterizes the surface S . You **do not** need to give reasons; only the **yes/no** answer will be graded.

$$\mathbf{r}(u, v) = u\mathbf{i} + v\mathbf{j} + \underbrace{(4 - u^2 - v^2)}_{\text{is between 4 and 3}}, \quad (u, v) \in \{\overset{3}{\cancel{0}} \leq u^2 + v^2 \leq \overset{4}{\cancel{4}}\}$$



is between 4 and 3, so not correct.

$$\mathbf{r}(u, v) = (\underbrace{\sqrt{4 - u}}_{\text{radius of circle at height } z=u} \cos v)\mathbf{i} + (\sqrt{4 - u} \sin v)\mathbf{j} + u\mathbf{k}, \quad (u, v) \in \{0 \leq u \leq 1, 0 \leq v \leq 2\pi\}$$

✓

$$\mathbf{r}(u, v) = (u \cos v)\mathbf{i} + (u \sin v)\mathbf{j} + (4 - u^2)\mathbf{k}, \quad (u, v) \in \{\sqrt{3} \leq u \leq 2, 0 \leq v \leq 2\pi\}$$

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