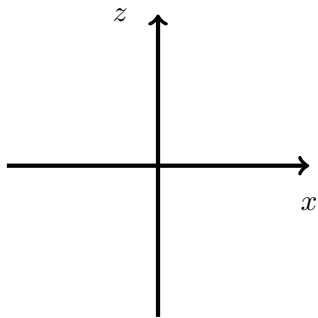


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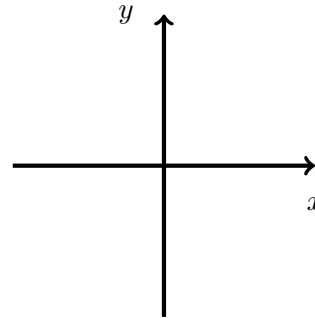
There are 20 points possible on this quiz. This is a closed book quiz and closed note quiz. Calculators are not allowed. If you have any questions, please raise your hand.

1. (2 points each) For the surface $z^2 - x^2 - 4y^2 = 4$, sketch the traces below *if the traces exist*. Label your graphs. Note axes have been given and labelled for you.

(a) The traces for $y = 0$ and $y = 1$.



(b) The traces for $z = 0$ and $z = 3$.



2. (2 points) Describe the surface $z = 1 - x^2$. Your description can be in words or with a rough sketch. I recommend both.

3. (4 points) Find any points where the curve $\vec{r}(t) = t\vec{i} + (2t - t^2)\vec{k}$ intersects the paraboloid $z = x^2 + y^2$.

4. (5 points) For the curve $\vec{r}(t) = \langle \sqrt{t^2 + 3}, t, \ln(t^2 + 1) \rangle$, find parametric equations for the tangent line to the curve at the point $(2, 1, \ln(2))$.

5. (4 points) Evaluate the integral $\int_0^4 ((2t^{3/2})\vec{i} + \vec{j} + (e^{2t})\vec{k}) dt$