## Quiz #6

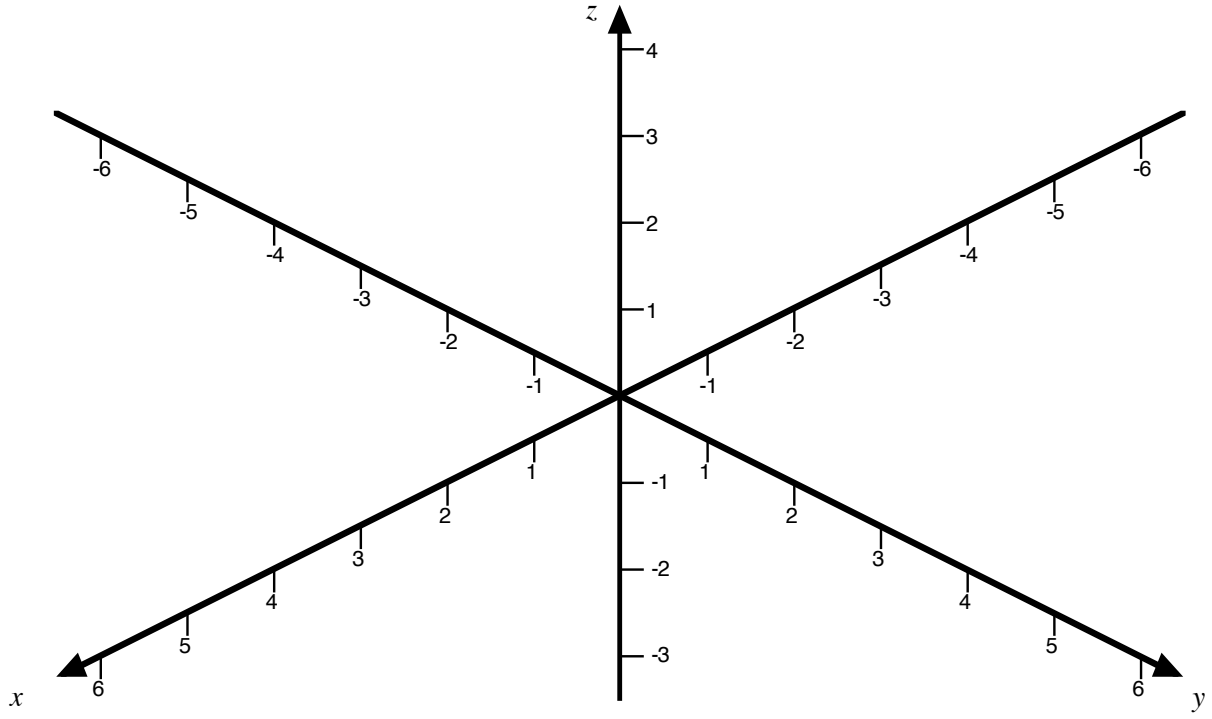
**1.** In each part of this problem you are given an equation that you should interpret as the equation of a surface in 3D. For each equation:

(i) Identify the type of surface (plane, sphere, elliptic paraboloid, etc.).

(ii) Locate the $x$, $y$ and $z$ intercepts (if any).

(iii) Use the axes provided to draw an accurate sketch of the surface.

**(a)** **(3 points)** $4x + 5y + 10\,z = 20.$



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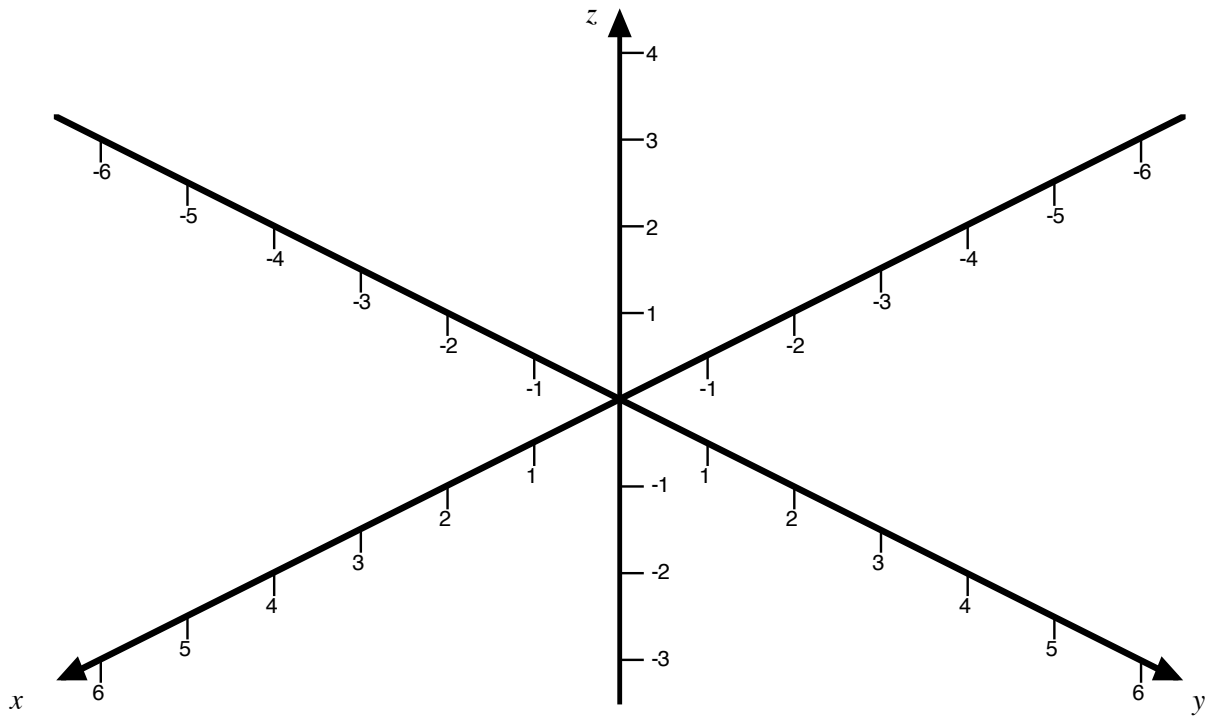
**(b)** **(3 points)** $x^2 = z + 3.$



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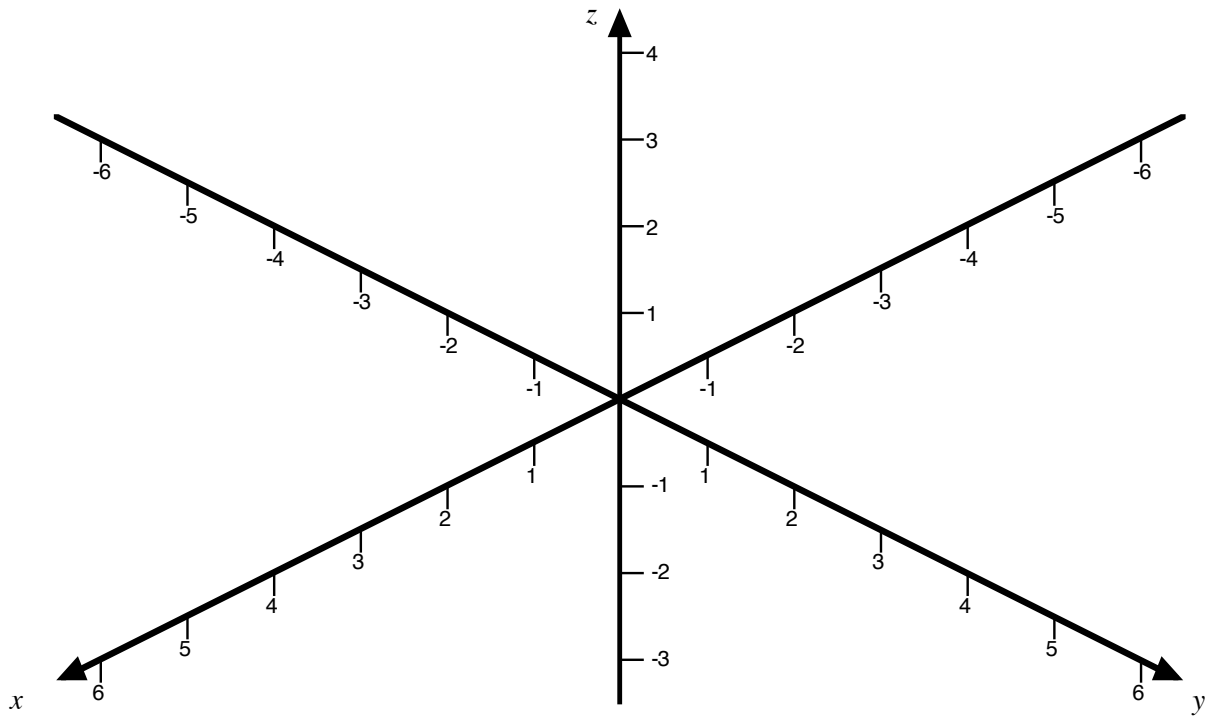
**(c)** **(3 points)** $x^2 + 4y^2 - z^2 = 4.$



**2.** **(1 points)** Does the limit:

$$\lim_{(x,y)\to(0,0)} \frac{x \cdot y}{\sqrt{x^2 + y^2}}$$

exist or not? Either calculate the value of the limit (showing your work – no work means no credit) or demonstrate that the limit does not exist.