

1. Match the equation

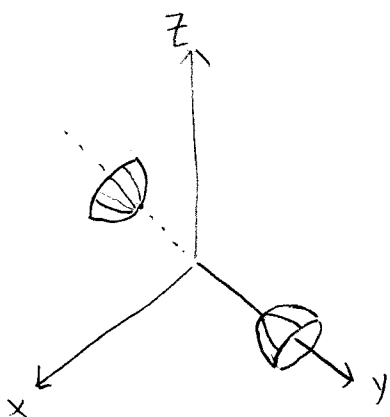
$$-2x^2 + y^2 - 3z^2 = 5$$

with one of the labeled graphs in the text book on page 874.

A) I B) II **C) III** D) V E) VI F) VIII

there is a positive constant. } (by table on p. 872)
 x, y, z are all square } \therefore this is a Hyperboloid of two sheets
 and two are negative

" y " is special b/c it is diff ie it has the only coeff > 0
 \therefore the surfaces are "along" the y -axis



looks like III. C

2. Match the equation

$$-2x^2 + y^2 - 3z^2 = 0$$

with one of the graphs in the text book on page 874.

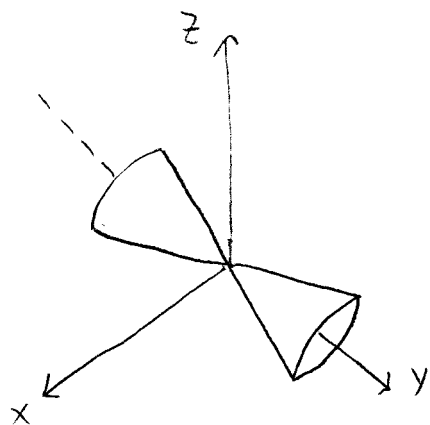
- Ⓐ I B) II C) III D) V E) VI F) VIII

no constant

put in std form: $y^2 = 2x^2 + 3z^2$ (use table p. 872)

x, y, z are all squared. and all positive. \Rightarrow cone

"y" is alone thus special \Rightarrow the cone is along/about y axis



looks like I A

3. Which set of inequalities represents the volume contained inside the sphere of radius 3 (with center $(0, 0, 0)$) and above the xy -plane?

- A) $r \leq 3, 0 \leq \theta \leq \pi, z \geq 0$
- B) $r \leq 3, 0 \leq \theta \leq 2\pi, z \geq 0$
- C) $r \leq 3, 0 \leq \theta \leq \pi, 0 \leq z \leq 3$
- D) $\rho \leq 3, 0 \leq \theta \leq 2\pi, 0 \leq \phi \leq \frac{1}{2}\pi$**
- E) $\rho \leq 3, 0 \leq \theta \leq 2\pi, 0 \leq \phi \leq \pi$
- F) $\rho \leq 3, 0 \leq \theta \leq \pi, 0 \leq \phi \leq \pi$

here radius 3 $\Rightarrow \rho \in [0, 3]$ so $\rho \leq 3$

strike A, B, C: we don't use "r" in spherical coords.

everything above the xy plane
 $\Rightarrow \theta \in [0, 2\pi]$ $\Rightarrow \phi \in [0, \frac{\pi}{2}]$

\Downarrow
strike E, F
 \therefore D must be it.

