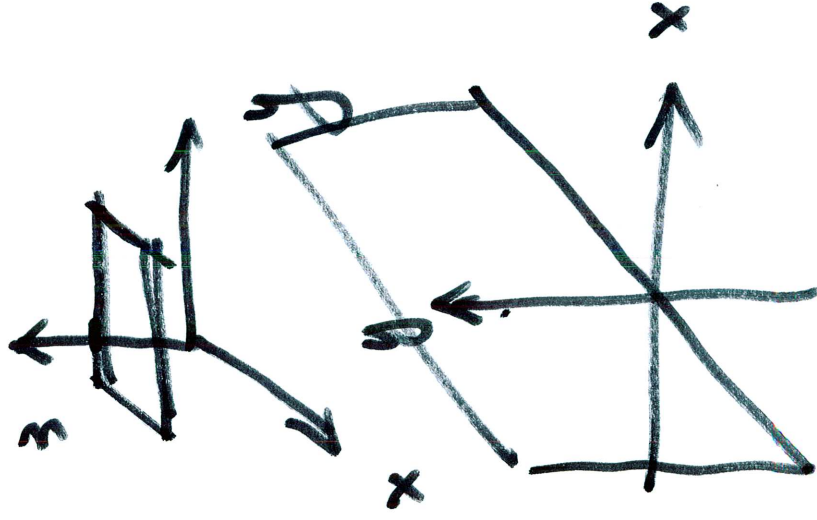
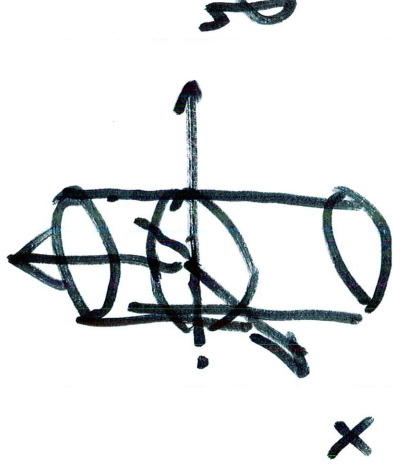


$$x^2 + y^2 = 1$$



$$(h, k, l)$$



#18 (P790)

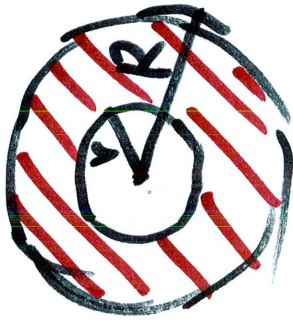
$$x^2 + y^2 + z^2 - 2y - 4z = \frac{10}{3}$$

$$(y-1)^2 - 1 + (z-2)^2 - 4 = \left(\sqrt{\frac{10}{3} + 5}\right)^2$$

#37 (P790)

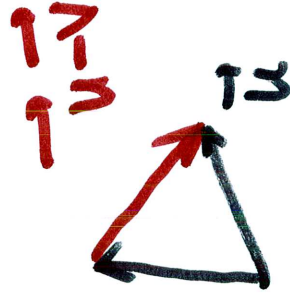
sphere $x^2 + y^2 + z^2 = r^2$ ball

$$x^2 + y^2 + z^2 \leq r^2$$



$$r^2 = x^2 + y^2 + z^2 < R^2$$

$\vec{v}$

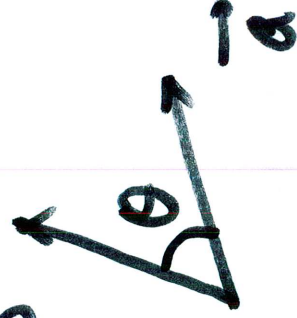


$$\vec{v} + (\vec{u} - \vec{v}) = \vec{u}$$

$$\vec{a} = \langle a_1, a_2 \rangle = a_1 \vec{i} + a_2 \vec{j}$$

$$\vec{a} \cdot \vec{b}$$

$\vec{b}$



$\vec{b}$



$$\vec{a} \cdot \vec{b} = \|\vec{a}\| \|\vec{b}\| \cos 90^\circ$$

#24 (§12.3)

$$(a) \quad \vec{u} = c\vec{v} \Rightarrow \vec{u} \parallel \vec{v} \Leftrightarrow \vec{u} \times \vec{v} = \vec{0}$$

$$(b) \quad \vec{u} \cdot \vec{v} = 2+1+2=5 \Rightarrow \vec{u} \perp \vec{v}, \quad \vec{u} \times \vec{v}$$

$$(c) \quad \langle a, b, c \rangle \cdot \langle -b, a, 0 \rangle = -ab + ba + 0 = 0$$

#26 (§12.3)

$$\begin{aligned} \langle 2, 1, -1 \rangle \cdot \langle 1, x, 0 \rangle &= \langle 2, 1, -1 \rangle \cdot \langle 1, x, 0 \rangle \cos 45^\circ \\ &= \sqrt{6} \sqrt{1+x^2} \frac{\sqrt{2}}{2} \\ 2+x+0 \end{aligned}$$

$$(2+x)^2 = \frac{6 \cdot 2}{4} (1+x^2)$$

$\vec{a}$
 $\vec{b}$

#4 (pg 14-815)
#20 2 unit vectors
+

#28

$$\frac{(\vec{a} - \vec{b}) \times (\vec{a} + \vec{b})}{|(\vec{a} - \vec{b}) \times (\vec{a} + \vec{b})|}$$

