

TWO APPLICATIONS OF VECTORS IN MECHANICS.

1. Collision of two ships

$$\text{Ship 1. } \underline{r} = \underline{OA} + t \underline{v}_1$$

$$\text{Ship 2. } \underline{r} = \underline{OB} + t \underline{v}_2$$

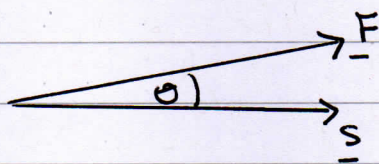
Ships collide if the lines intersect and IF AND ONLY IF they are at the same place at the same time

equate i's equate j's find t

show this satisfies the k's

then they collide, sub t back in to find the point of collision

2. Resolving a force \underline{F} in the direction \underline{s}



$$\text{since } |\underline{F}| |\underline{s}| \cos \theta = \underline{F} \cdot \underline{s}$$

$$\text{then } |\underline{F}| \cos \theta = \frac{\underline{F} \cdot \underline{s}}{|\underline{s}|}$$

$$= \underline{F} \cdot \hat{\underline{s}}$$