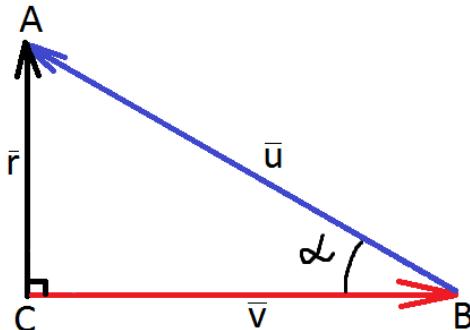


If  $v$  and  $u$  are two vectors and  $r$  is their resultant and  $r$  is perpendicular to  $v$  and  $1/2$  of  $u$  then what is angle between  $v$  and  $u$

**Solution:**



The beginning of the vector  $\vec{r}$  - the beginning of the vector  $\vec{v}$  and the end vector  $\vec{r}$  - end of the vector  $\vec{u}$

$$\vec{u} + \vec{v} = \vec{r}$$

$$|\vec{r}| = \frac{1}{2} |\vec{u}|$$

We have a right triangle ABC, we can simply find the sine of the angle alpha ( $\alpha$  – the angle between the vectors  $\vec{u}$  and  $\vec{v}$ )

$$\sin \alpha = \frac{AC}{AB} = \frac{|\vec{r}|}{|\vec{u}|} = \frac{\frac{1}{2} |\vec{u}|}{|\vec{u}|} = \frac{1}{2}$$

$$\alpha = 30^\circ \left(\frac{\pi}{6}\right)$$

**Answer:** angle between  $\vec{u}$  and  $\vec{v}$  is  $\alpha = 30^\circ \left(\frac{\pi}{6}\right)$