

VR - Review

Answer each question with the given vectors.

$\vec{v} = \langle -1, -1 \rangle$ $\vec{u} = \langle 3, 4 \rangle$ $\vec{w} = \langle \sqrt{3}, -1 \rangle$

$\vec{r} = (2, 330^\circ)$ $\vec{s} = (3, 200^\circ)$ $\vec{t} = (1, 225^\circ)$

1. Find $2\vec{v} = 2\langle -1, -1 \rangle$

$= \langle -2, -2 \rangle$

2. Find $-\vec{u} = \langle -3, -4 \rangle$

$\vec{u} = \langle 3, 4 \rangle$

3. Find $\vec{v} + \vec{u} = \langle 2, 3 \rangle$

$\vec{v} = \langle -1, -1 \rangle$

$\vec{u} = \langle 3, 4 \rangle$

4. Find $2\vec{v} - 3\vec{u} = 2\langle -1, -1 \rangle + (-3)\langle 3, 4 \rangle$
 $= \langle -2, -2 \rangle + \langle -9, -12 \rangle$

$\vec{v} = \langle -1, -1 \rangle$

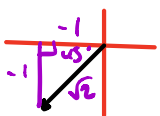
$\vec{u} = \langle 3, 4 \rangle$

$= \langle -11, -14 \rangle$

5. Convert \vec{v} to polar.

$\vec{v} = \langle -1, -1 \rangle$

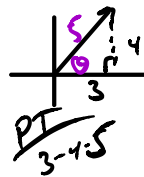
$\vec{v} = (\sqrt{2}, 225^\circ)$



6. Convert \vec{u} to polar.

$\vec{u} = \langle 3, 4 \rangle$

$\vec{u} = (5, 53^\circ)$



$\vec{u} = (\sqrt{x^2+y^2}, \tan^{-1}(\frac{y}{x}))$

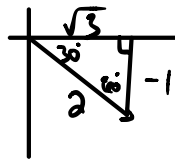
$\tan \theta = \frac{4}{3} \Rightarrow \theta = \tan^{-1}(\frac{4}{3})$
 $\theta = 53^\circ$

7. Convert \vec{w} to polar.

$\vec{w} = \langle \sqrt{3}, -1 \rangle$

$\vec{w} = (2, -30^\circ)$

$\vec{w} = (2, 330^\circ)$

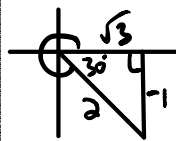


8. Convert \vec{r} to components.

$\vec{r} = (2, 330^\circ)$

$\vec{r} = \langle r \cos \theta, r \sin \theta \rangle$

$\vec{r} = \langle \sqrt{3}, -1 \rangle$

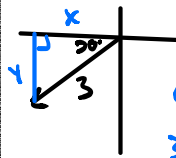


9. Convert \vec{s} to components.

$\vec{s} = \langle 3 \cos 200^\circ, 3 \sin 200^\circ \rangle$

$\vec{s} = (3, 200^\circ)$

$\vec{s} = \langle -2.82, -1.03 \rangle$



$\cos 200^\circ = \frac{x}{3}$

$\sin 200^\circ = \frac{y}{3}$

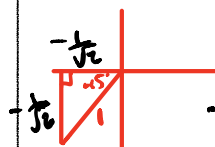
$3 \cos 200^\circ = x$

$3 \sin 200^\circ = y$

10. Convert \vec{t} to components.

$\vec{t} = (1, 225^\circ)$

$\vec{t} = \langle -\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2} \rangle$



$-\frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{2} = -\frac{1}{2}$