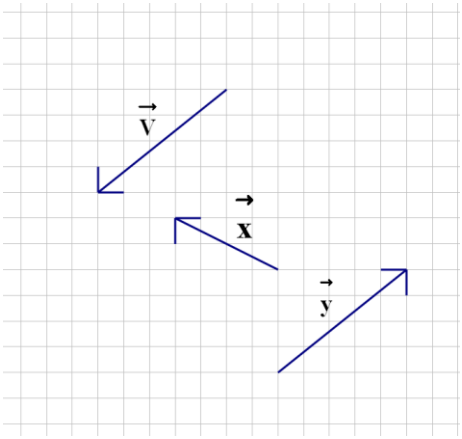
PreCalc

Name_____

Vector Study Guide

Period_____



Preform the following operations graphically.

1. $\vec{v} + \vec{y}$

2. $2\vec{x} + \vec{v}$

3. $\vec{y} - \vec{x}$

4. Write $\vec{v}$ in component form.

5. Write $2\vec{y}$ in component form.

Write $\vec{v}$ in a*i* + b*j* form.

Write $2\vec{v}$ in a*i* + b*j* form.

$\overrightarrow{a} = \langle -1,\ 4 \rangle$ $\overrightarrow{b} = \langle 10, -2 \rangle$

6. Find $\overrightarrow{a} + \overrightarrow{b}$

7. $\frac{1}{2}\overrightarrow{b}$

8. $2\overrightarrow{b} - 3\overrightarrow{a}$

9. Find the unit vector for $\overrightarrow{b}$.

10. Find the unit vector for $\overrightarrow{a}$.

Find the vector $\vec{v}$ with the given magnitude and the same direction as $\vec{u}$.

11. $\|\vec{v}\| = 10, \vec{u} = \langle -3, 4 \rangle$

12. $\|\vec{v}\| = 13, \vec{u} = \langle 5, -12 \rangle$

Find the direction angle of each vector & and the magnitude.

13. Initial point (-2, 1) and terminal point (3, -2)

14. **v** = -5*i* + 4*j*

15. Find component form of $\|\vec{u}\| = 10$, angle = 90°

16. Find component form of $\|\vec{u}\| = 5$, angle = 120°

Find $\vec{v} \cdot \vec{w}$. (Dot Product)

17. $\vec{v} = 3\vec{\imath} - \vec{j}, \quad \vec{w} = -3\vec{\imath} + 2\vec{j}$

18. $\vec{v} = -3\vec{\imath} - 5\vec{j}, \quad \vec{w} = 2\vec{\imath} + 3\vec{j}$

Find the angle between $\vec{v}$ and $\vec{w}$.

19. $\vec{v} = 4\vec{\imath} + 3\vec{j}, \quad \vec{w} = 3\vec{\imath} + 5\vec{j}$

20. $\vec{v} = 5\vec{\imath} + 5\vec{j}, \quad \vec{w} = -8\vec{\imath} + 8\vec{j}$

Determine if the vectors are orthogonal, parallel or neither.

21. **u** = $\langle -12, 30 \rangle$ & **v** = $\langle \frac{1}{2}, -\frac{5}{4} \rangle$

22. **u** = $\langle -12, 30 \rangle$ & **v** = $\langle -6, \ 15 \rangle$

23. Find k so that $\vec{u}$ and $\vec{v}$ are orthogonal.
$\vec{u} = 2\vec{\imath} - 2\vec{j}, \quad \vec{v} = 1\vec{\imath} - k\vec{j}$

26. A plane is flying due east at 450 mph and the wind is blowing at an angle of 135° at 35 mph. What is the actual direction of the plane?