CCGPS Pre-Calculus Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
Unit 6 Vectors Review

Find the component form of $\rightharpoonaccent{AB}$. Then find the magnitude of $\rightharpoonaccent{AB}$.

1. A(2, 4), B(-1, 3) 2. A(4, -2), B(5, -5) 3. A(-4, 2, 7), B(3, -1, 4)

Let $\rightharpoonaccent{v}=\left〈2,-1\right〉$ and $\rightharpoonaccent{w}=\left〈-3,5\right〉$. Find $\rightharpoonaccent{u}$ and sketch the vector operations geometrically.

 4. $\rightharpoonaccent{u}=\rightharpoonaccent{v}+\rightharpoonaccent{w}$ 5. $\rightharpoonaccent{u}=\rightharpoonaccent{v}-\rightharpoonaccent{w}$ 6. $\rightharpoonaccent{u}=3\rightharpoonaccent{v}$

 7. $\rightharpoonaccent{u}=\rightharpoonaccent{w}-2\rightharpoonaccent{v}$ 8. $\rightharpoonaccent{u}=2\rightharpoonaccent{v}+3\rightharpoonaccent{w}$ 9. $\rightharpoonaccent{u}=5\rightharpoonaccent{w}-2\rightharpoonaccent{v}$

Find a unit vector for each vector.

 10. $\rightharpoonaccent{u}=\left〈-3,4\right〉$ 11. $\rightharpoonaccent{v}=\rightharpoonaccent{i}+5\rightharpoonaccent{j}$

Find the direction angle of each vector. Pay attention to the appropriate quadrant using values [0,360].

 12. $\rightharpoonaccent{u}=2\rightharpoonaccent{i}-5\rightharpoonaccent{j}$ 13. $\rightharpoonaccent{u}=-3\rightharpoonaccent{i}-7\rightharpoonaccent{j}$ 14. $\rightharpoonaccent{u}=6\rightharpoonaccent{i}-2\rightharpoonaccent{j}$

Find the component form of each vector.

 15. $\left‖u\right‖=20, θ=150°$ 16. $\left‖u\right‖=10, θ=315°$

Find $\rightharpoonaccent{v}∙\rightharpoonaccent{w}$.

 17. $\rightharpoonaccent{v}=5\rightharpoonaccent{i}-2\rightharpoonaccent{j}, \rightharpoonaccent{w}=-3\rightharpoonaccent{i}+\rightharpoonaccent{j}$ 18. $\rightharpoonaccent{v}=3\rightharpoonaccent{i}-9\rightharpoonaccent{j}+2\rightharpoonaccent{k}, \rightharpoonaccent{w}=2\rightharpoonaccent{i}+\rightharpoonaccent{j}-4\rightharpoonaccent{k}$

Find the angle Θ between v and w.

 19. $\rightharpoonaccent{v}=5\rightharpoonaccent{i}-2\rightharpoonaccent{j}, \rightharpoonaccent{w}=-3\rightharpoonaccent{i}+\rightharpoonaccent{j}$ 20. $\rightharpoonaccent{v}=3\rightharpoonaccent{i}-9\rightharpoonaccent{j}+2\rightharpoonaccent{k}, \rightharpoonaccent{w}=2\rightharpoonaccent{i}+\rightharpoonaccent{j}-4\rightharpoonaccent{k}$

Find the cross product of v and w. What does this answer represent?

21. $\rightharpoonaccent{v}=3\rightharpoonaccent{i}-9\rightharpoonaccent{j}+2\rightharpoonaccent{k}, \rightharpoonaccent{w}=2\rightharpoonaccent{i}+\rightharpoonaccent{j}-4\rightharpoonaccent{k}$ 22. $\rightharpoonaccent{v}=2\rightharpoonaccent{i}+2\rightharpoonaccent{k}, \rightharpoonaccent{w}=3\rightharpoonaccent{i}+\rightharpoonaccent{j}-4\rightharpoonaccent{k}$

Translate the following points to polar coordinates.

 25. (-5, 7) 26. (3, -7) 27. (-5, -12)

Translate the following points to rectangular coordinates.

 28. (25, 225°) 29. (8, 11π/6) 30. (6, 133°)

For the following complex numbers, a) plot the number, b) find the absolute value, c) translate the number into the opposite form (rectangular to polar or vice versa), and d) plot the number on the other coordinate system.

 31. 5 – 4i 32. 6(cos 3π/4 + i sin 3π/4) 33. -6 + 3i

Application problems

A boat is traveling at 23 knots at a trajectory of 12° South of East. It is going against a current that is flowing 5 knots SW.

1. Find the resultant vector of the boat.
2. What is the speed of the boat including the current?
3. What is the trajectory of the boat including the current?
4. If the boat is trying for land that is exactly 100 knots east of its current position, how long will it take the get there? How far south of its current position will it land?

A plane is traveling at 540 mph with a bearing of 200°. It is traveling against a headwind blowing at 26 mph NE.

1. Find the resultant vector of the plane.
2. What is the groundspeed of the plane including the wind?
3. What is the bearing of the plane including the wind?