

No Bell Ringer

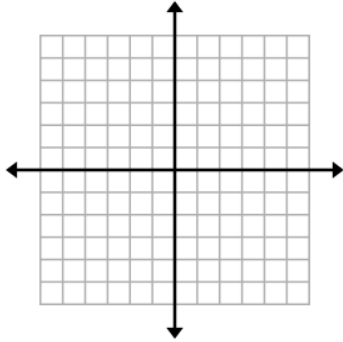
Get out Week #13 Packet

Vector Quiz Tomorrow

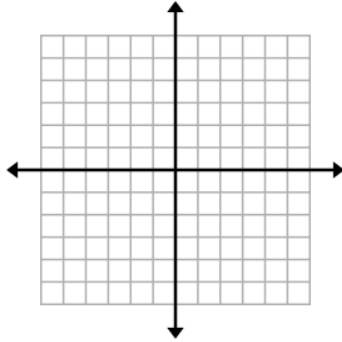
Introduction to Vectors

Draw the vector described.

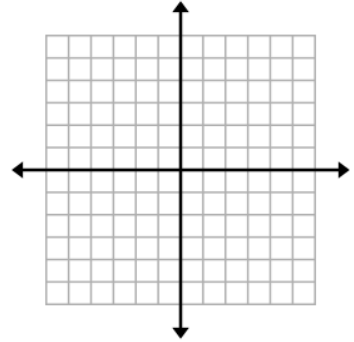
1. $P_i(3, 5)$ $P_t(-4, 1)$



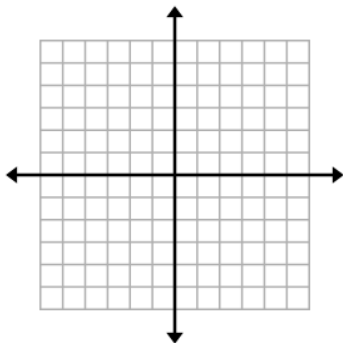
2. $P_i(-2, 4)$ $P_t(6, 4)$



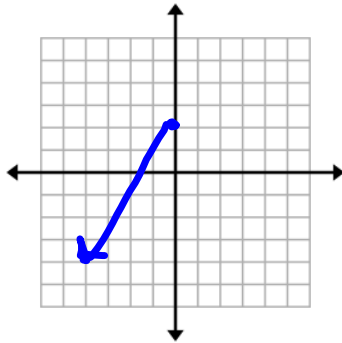
3. $P_i(5, 0)$ $P_t(-2, 3)$



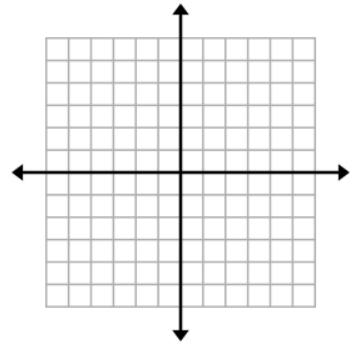
4. $P_i(-4, -2)$ $P_t(-4, 6)$



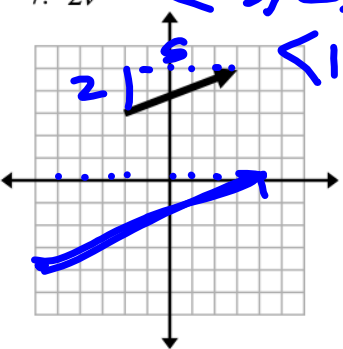
5. $P_i(0, 2)$ $P_t(-4, -4)$



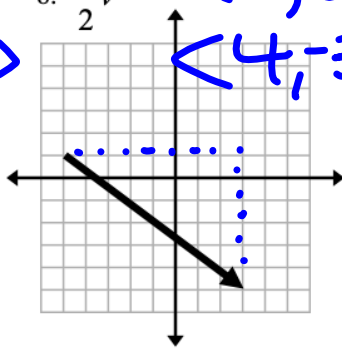
6. $P_i(3, -3)$ $P_t(-1, 4)$



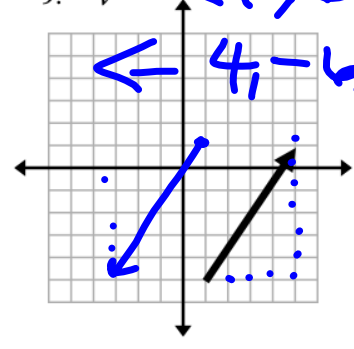
7. $2\vec{v}$ $\langle 9, 2 \rangle$
 $\langle 10, 4 \rangle$



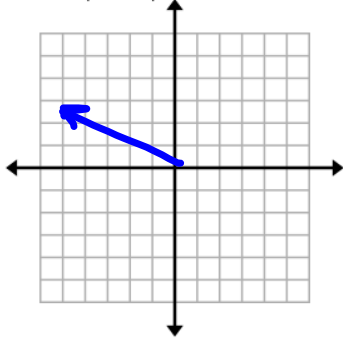
8. $\frac{1}{2}\vec{v}$ $\langle 8, 6 \rangle$
 $\langle 4, 3 \rangle$



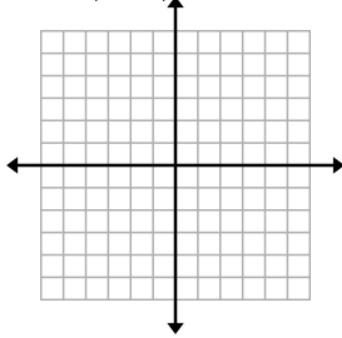
9. $-\vec{v}$ $\langle 4, 6 \rangle$
 $\langle -4, -6 \rangle$



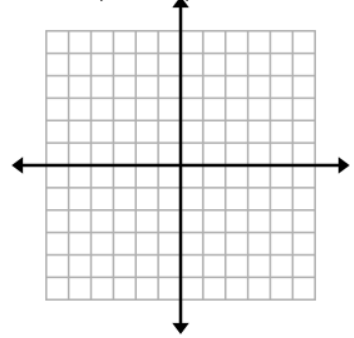
10. $\langle -5, 2 \rangle$



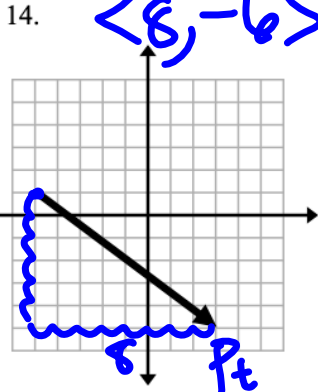
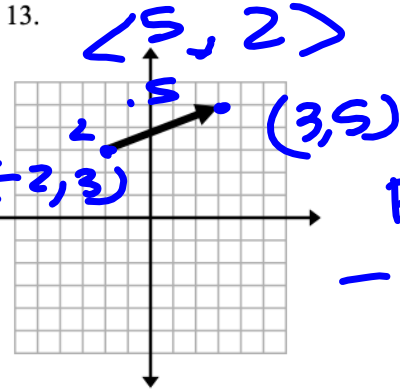
11. $\langle 4, -3 \rangle$



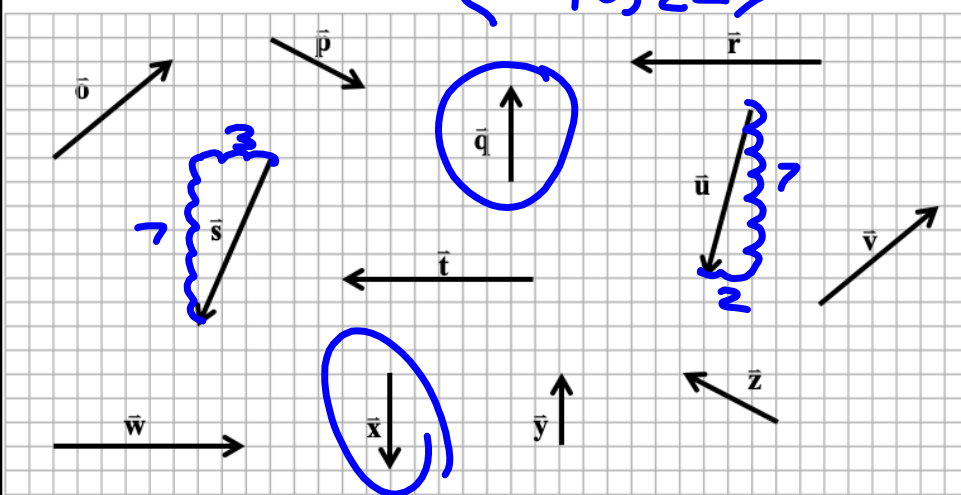
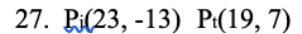
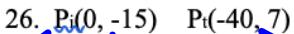
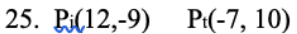
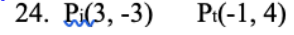
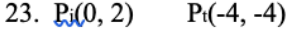
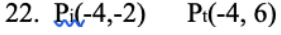
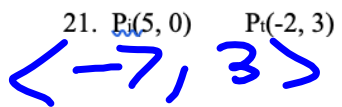
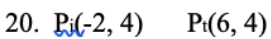
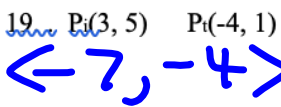
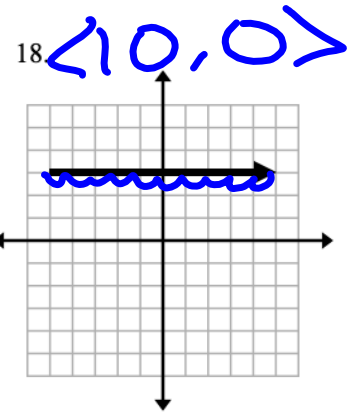
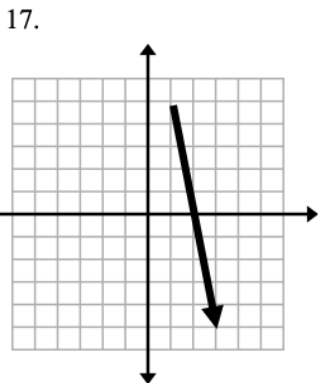
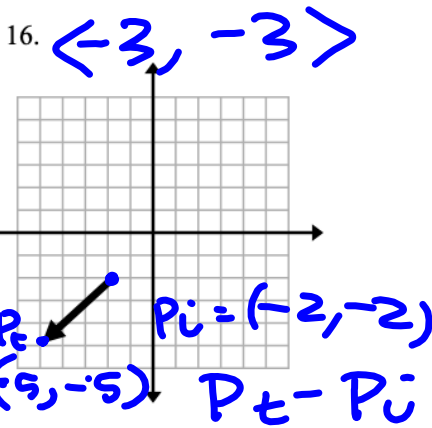
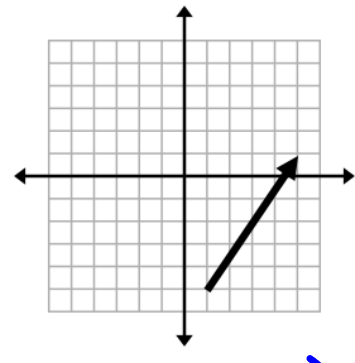
12. $\langle -2, -5 \rangle$



Write the component form of each vector.

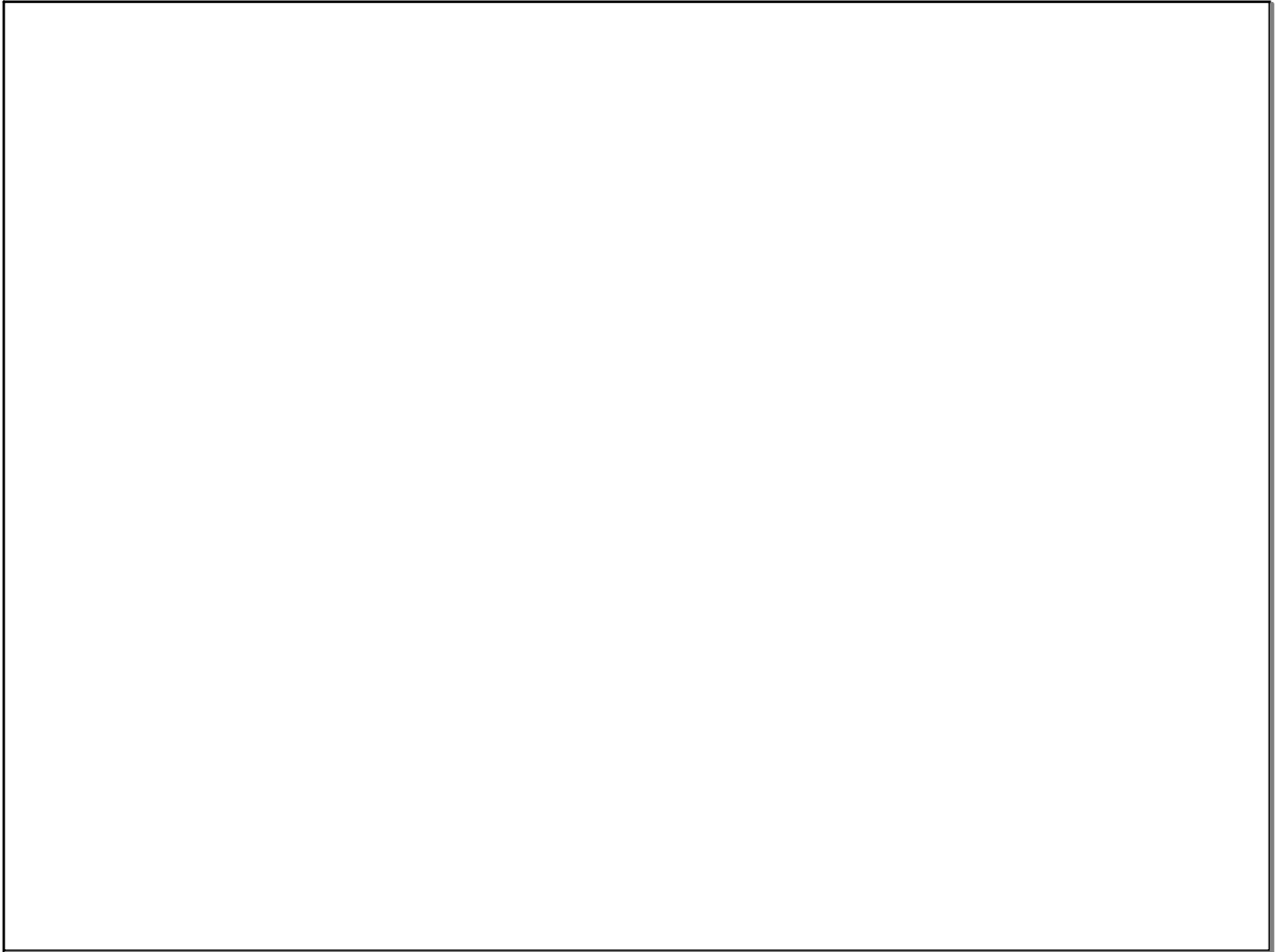


$P_t - P_i = \text{Component}$



28. Match up any two vectors in the drawing that are equal and list them.

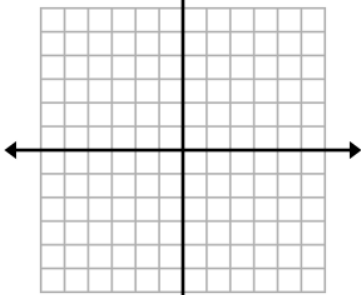
29. Why are \vec{q} and \vec{x} considered to be different vectors?



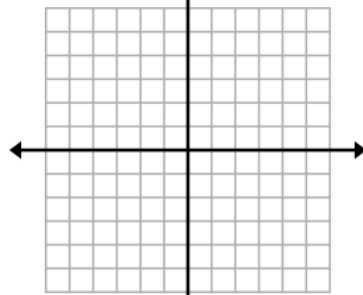
Work on Vector Review

Draw the vector described.

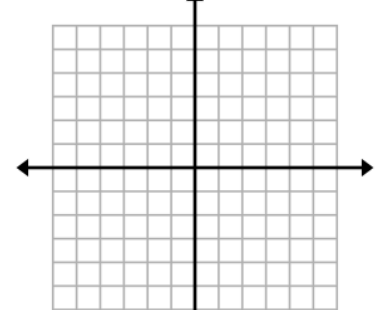
1. $P_i (4, 5)$ $P_t (-3, 2)$



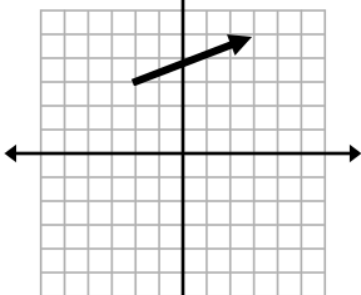
2. $P_i (6, 3)$ $P_t (0, 4)$



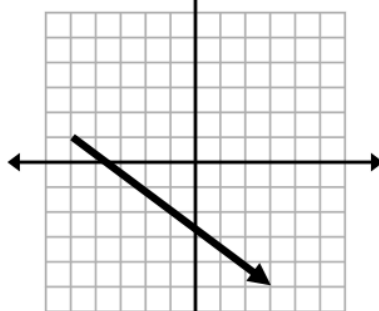
3. $P_i (-3, -6)$ $P_t (-4, 4)$



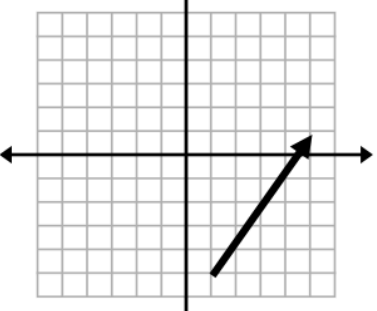
4. $3\vec{v}$



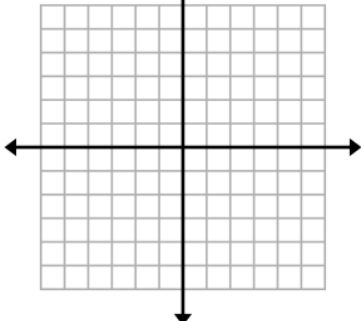
5. $\frac{1}{2}\vec{v}$



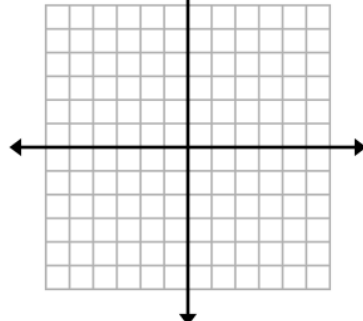
6. $-\vec{v}$



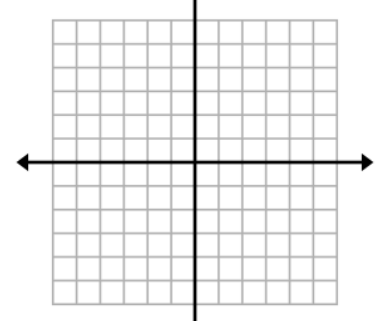
7. $\langle -3, 6 \rangle$



8. $\langle 4, 6 \rangle$



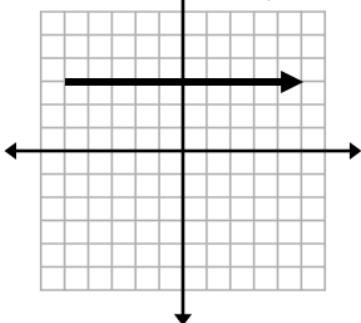
9. $\langle 3, -3 \rangle$



Write the component form of each vector.

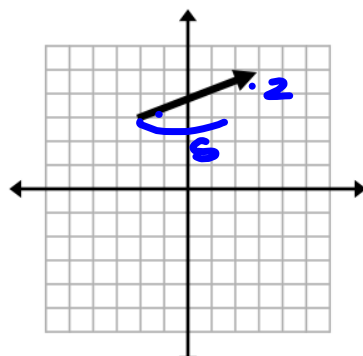
10.

$\langle 10, 0 \rangle$

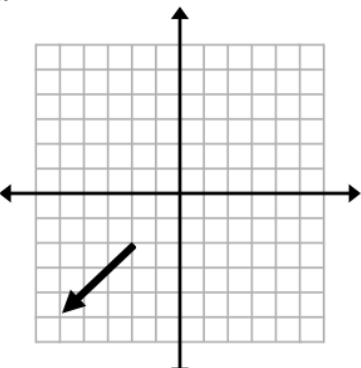


11.

$\langle 9, 2 \rangle$

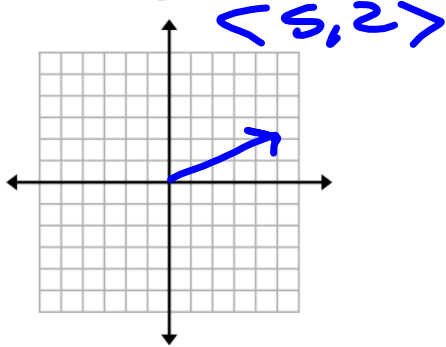


12.

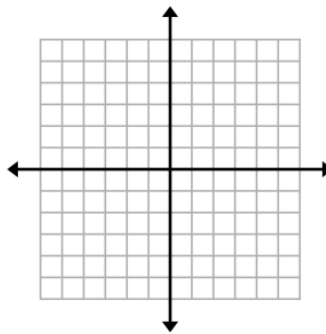


Draw a vector congruent to each indicated vector.

13. Vector in problem #11



14. Vector in problem #12



15. Find $\|v\|$ if $v = \langle 8, -4 \rangle$

$$\sqrt{8^2 + (-4)^2} = \sqrt{80} = 8.94$$

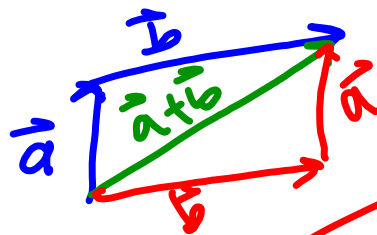
16. Find $\|v\|$ if its initial point is $(3, 5)$ and its terminal point is $(-4, 5)$.

Handwritten notes: $P_i = (3, 5)$, $P_t = (-4, 5)$, $\|v\| = 7$

$$\langle -7, 0 \rangle$$

17. Create two pairs of initial and terminal points that represent the vector $v = \langle 3, -5 \rangle$.

18. Draw a representation of $\vec{a} + \vec{b}$ using the parallelogram rule.



Given $u = \langle -2, 4 \rangle$ and $v = \langle 3, -2 \rangle$.

19. Find $\|u + v\|$

$$\|\langle 1, 2 \rangle\| = \sqrt{1^2 + 2^2} = \sqrt{5}$$

20. Find $\|u - v\|$

$$\|\langle -5, 6 \rangle\| = \sqrt{(-5)^2 + 6^2} = \sqrt{61}$$

21. Find $\|u\| + \|v\|$

$$\sqrt{4+16} + \sqrt{9+4} = \sqrt{20} + \sqrt{13} = 8.078$$

22. Find $\|u\| - \|v\|$

$$\sqrt{20} - \sqrt{13} = 0.867$$

23. Find $6v$

$$6 \cdot \langle 3, -2 \rangle = \langle 18, -12 \rangle$$

24. Find $1/2 v$

$$\langle -\frac{3}{2}, 1 \rangle$$

25. Find $-2u$

$$\langle 4, -8 \rangle$$

26. Find $\|2u + 3v\|$

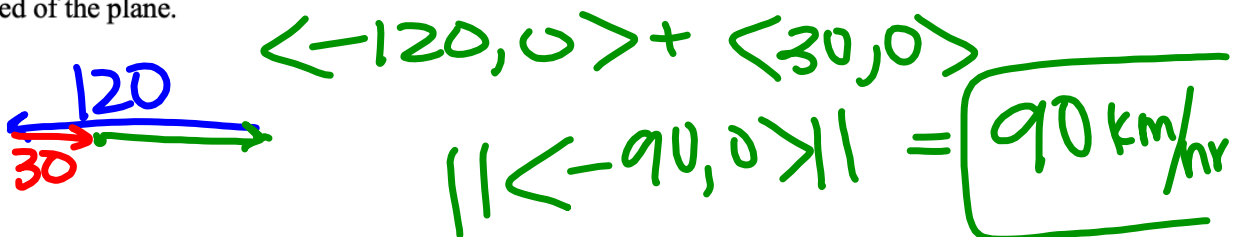
$$\langle -4, 8 \rangle + \langle 9, -6 \rangle = \langle 5, 2 \rangle$$

$$\|\langle 5, 2 \rangle\| = \sqrt{29}$$

27. Find $\|3u - 4v\|$

Model each situation with vectors and find the solution.

28. Suppose a plane is traveling west at 120 km/hr. with a head wind of 30 km/hr. Find the resulting speed of the plane.





29. Suppose a river boat is heading south across a river at a speed of 5 m/s. The current of the river is moving at 2 m/s west. Find the resulting speed of the river boat.

$$\langle 0, -5 \rangle + \langle -2, 0 \rangle = \langle -2, -5 \rangle$$

$$\boxed{5.39 \text{ m/s}} = \sqrt{(-2)^2 + (-5)^2} = \sqrt{29}$$

30. You are going to swim across a 25 m (0.025 km) river with a current of 8 km/hr. You can swim at 2 km/hr. Estimate how far downstream you are when you reach the other side.

31. You push on a box with a force of 450 newtons directly north. Another pushes the box with a force of 600 newtons directly east. What is the resultant force?

$$\langle 0, 450 \rangle + \langle 600, 0 \rangle = \langle 600, 450 \rangle$$

$$\sqrt{600^2 + 450^2} = \boxed{750 \text{ NEWTONS}}$$

32. On a bike ride Bobbie rides 40 miles west, then 30 miles south, then 25 miles west and finally 40 miles north. Using vectors on a coordinate grid, what was her total displacement in component form?

$$\langle -40, 0 \rangle + \langle 0, -30 \rangle + \langle -25, 0 \rangle + \langle 0, 40 \rangle$$

$$\boxed{\langle -65, -70 \rangle}$$

65 miles west, 70 miles south

33. You are on an elevator that is plummeting toward the ground at 32 m/s and you jump up right before it hits the ground. You jump upward with a velocity of 4 m/s. At what speed do you hit the ground?



$$\langle 0, -32 \rangle + \langle 0, 4 \rangle = \langle 0, -28 \rangle$$

$$\boxed{28 \text{ m/s}}$$