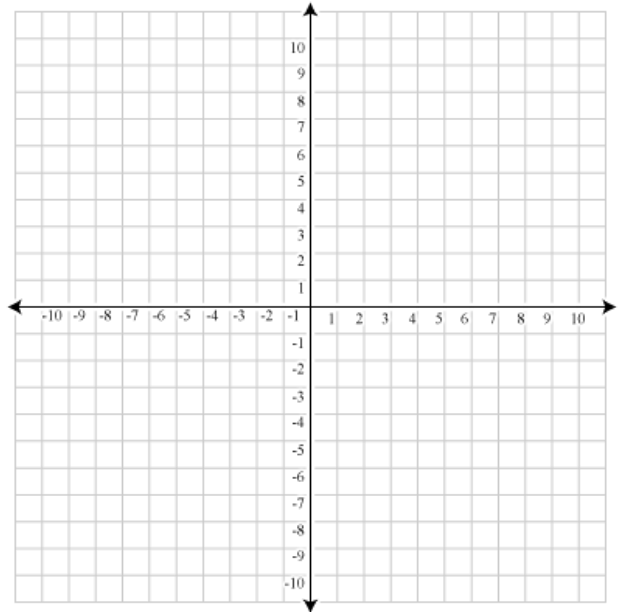


1. A vector v has initial point $R(-9, 2)$ and terminal point $S(-4, 6)$.

- a) In component form
- b) As a linear combination of i and j .
- c) Find $\|v\|$
- d) Sketch v in standard position.



- e) Find the Direction Angle of v .

2. Verify whether vectors r and s are equal. If not, explain why not.

$$\overline{ST} \text{ (with } S(11, -29) \text{ and } T(2, -23)) \text{ and } r = \langle -9, 6 \rangle$$

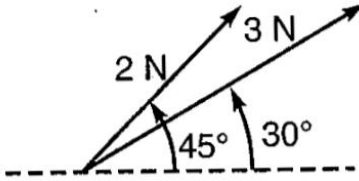
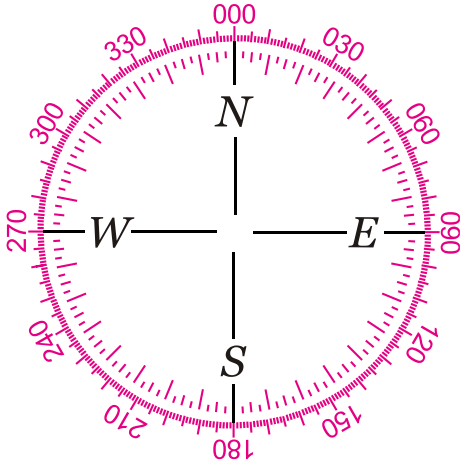
3. Given vectors $u = \langle -5, 2 \rangle$ and $v = \langle -6, 12 \rangle$, find the following.

- a) $2v + 4u$
- b) $5v$
- c) $5(u - v)$

4. Find the component form of the vector w with $\|w\| = 15$ in the same direction as $u = \langle 4, 3 \rangle$.

5. Find the direction angle of the vector.

- a) $v = \langle -8, -4 \rangle$
- b) $w = 12i - 10j$

<p>6. Convert to rectangular form. $\left(-8, \frac{-5\pi}{4}\right)$</p>	<p>7. Find the magnitude for $\left(-2, \frac{4\pi}{3}\right)$</p>
<p>8. Convert to polar form. $(-13\sqrt{15}, 13\sqrt{15})$</p>	<p>9. Convert to polar form $(0, -2.7)$</p>
<p>10. A vector has magnitude 8 and direction angle 136°. Write the vector in component form.</p>	<p>11. Find the dot product (cross product). $U = \langle 3, 9 \rangle$ and $v = \langle 6, 5 \rangle$</p>
<p>12. Are the vectors parallel, orthogonal or neither. $U = \langle -2, 8 \rangle$ and $v = \langle 16, -64 \rangle$</p>	<p>13. Find the magnitude and direction of the resultant vector from the diagram below.</p> 
<p>14. If a plane is flying on a path that is coming from a bearing of 210°. Express that bearing as an angle in standard position.</p> 	

15. A 10-newton force acting at 45° and a 20-newton force acting at 130° act concurrently on an object. Find the magnitude and direction of the resultant force.

16. A ship is traveling at a speed of 60 miles per hour with a bearing of 60° on the river with negligible water velocity. When the ship reaches a certain point, it encounters water flow with a velocity of 10 miles per hour in the direction S 45° E. What are the resultant speed and direction of the ship?

17. Two people are trying to collectively push a box across a room towards the door. Person A pushes with a force of 330 newtons at a 350° from standard position. Person B pushes with a force of 300 newtons at a -150° from standard position.

- a. Who contributes more force towards the door?
- b. By how much?
- c. What is the total force contributed to push this box?