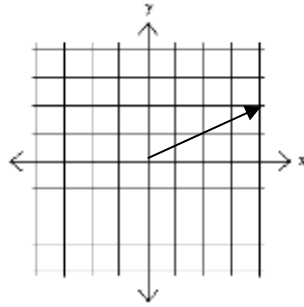


NON-Calculator

1) Let $\mathbf{a} = \langle -4, \frac{1}{2} \rangle$ and $\mathbf{b} = \langle \frac{2}{3}, -1 \rangle$. Find $4\mathbf{a} - 3\mathbf{b}$. Put in Linear Combination form.

2) Given $Q = (7, 2)$ and $P = (-1, -2)$. Find the magnitude of the vector \overline{PQ} .



3) Find the component form of the vector.

4) Find the Unit Vector in the direction of: $\mathbf{w} = \langle -15, 8 \rangle$.

5) Find the Unit Vector in the direction of: $\mathbf{w} = \langle 9, 3 \rangle$

6) State & Verify 2 vectors one in the 2nd Q and one in the 3rd Q that are orthogonal.

7) Find the dot product of \mathbf{u} and \mathbf{v} . $\mathbf{u} = \langle \frac{2}{3}, -4 \rangle$ and $\mathbf{v} = \langle -2, \frac{2}{5} \rangle$.

8) Find the dot product of \mathbf{u} and \mathbf{v} . $\mathbf{u} = -5\langle 1, 0 \rangle + 2\langle 0, 1 \rangle$ and $\mathbf{v} = 7\langle 1, 0 \rangle - 9\langle 0, 1 \rangle$.

9) Find the work done by a crane lifting a 585 lb. girder 72 ft.

10) Find the inverse of A, if A has an inverse.

$$A = \begin{bmatrix} 4 & -2 \\ 1 & 5 \end{bmatrix}$$

Calculator

11) Given $O = (11, -12)$ & $P = (-5, 4)$. Find the component form of vector \overrightarrow{PO} .

12) Let $\mathbf{v} = \langle -1, 1 \rangle$ and $\frac{1}{2}\mathbf{u} - 6\mathbf{v} = \langle 7, 4 \rangle$. Find \mathbf{u} .

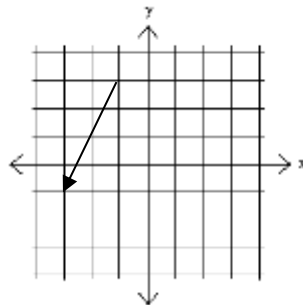
13) Find the direction angle of the vector $\mathbf{u} = \langle 7, -2 \rangle$

14) Find the Unit vector in the direction of $\mathbf{v} = \langle -9, -11 \rangle$.

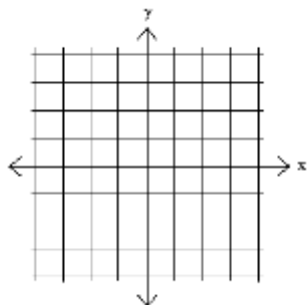
15) Find the angle between the 2 vectors, $\mathbf{u} = \langle 6, -1 \rangle$ and $\mathbf{v} = \langle 2, 12 \rangle$.

16) Find the angle between the 2 vectors, $\mathbf{u} = \langle 2, 2 \rangle$ and $\mathbf{v} = \langle -1, -4 \rangle$.

17) Find the component form of the vector.



18) Given $\mathbf{u} = \langle 8, 2, 3.7 \rangle$. Draw \mathbf{u} with magnitude and direction.



19) Find the work done by a force F of 72 lbs. acting in the direction of $\langle 2,1 \rangle$ in moving an object 5 feet along the x-axis starting at $(0,0)$.

20) A car is parked on the side of a hill inclined at 7° . The weight of the car is 2345 lbs. What force F is required to keep the car in place?

21) Solve the system of equations

$$x + z + w = 2$$

$$x + y + z = 3$$

$$3x + 2y + 3z + w = 8$$

22) Solve the system of equations

$$x + 2y + z = -1$$

$$x - 3y + 2z = 1$$

$$2x - 3y + z = 5$$

23) Find the partial fraction decomposition for $\frac{-x+10}{x^2+x-12}$

24) Find the partial fraction decomposition for $\frac{x^2-2x+1}{(x-2)^3}$

25) Represent the problem using an augmented matrix and solve the problem.

A florist makes cut flower arrangements for Mother's Day, involving roses, carnations, and lilies. The florist prices the arrangement at \$20 and roses cost \$3.50, carnations cost \$1.50, and lilies cost \$2. If the arrangement can have 24 flowers and there needs to be twice as many carnations as roses, how many of each type of flower is needed to make the arrangement?