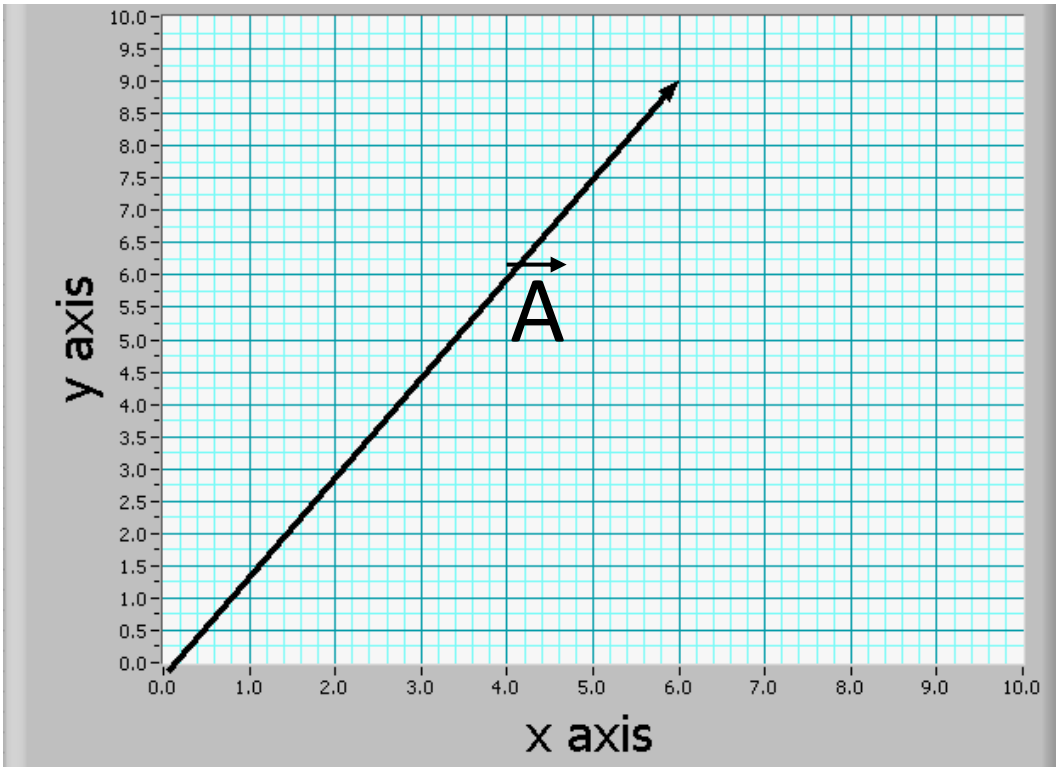
1/ Which of the following are vectors and which are scalars?

- Power
- Force
- Velocity
- Acceleration
- Time
- Coefficient of friction
- Temperature
- Altitude
- Angular velocity
- Torque
- Pressure
- Frequency

2/ What are the x and y components of the vector shown below?



3/ Calculate the sum of the vectors $\vec{A} = 4\vec{x} + 7\vec{y}$ and $\vec{B} = \vec{x} - 3\vec{y}$. Sketch $\vec{A}$ and $\vec{B}$ and the resultant vector.

4/ Subtract the vector $\vec{B} = -2\vec{x} + 5\vec{y}$ from the vector $\vec{A} = 6\vec{x} + 2\vec{y}$ and. Sketch $\vec{A}$ and $\vec{B}$ and the resultant vector.

5/ Multiply the vector $\vec{A} = -3\vec{x} + 2\vec{y}$ by the scalar 3. Sketch $\vec{A}$ and the resultant vector.

6/ Calculate the magnitude of the vector $\vec{A} = 9\vec{x} - 6\vec{y}$.

[10.81]

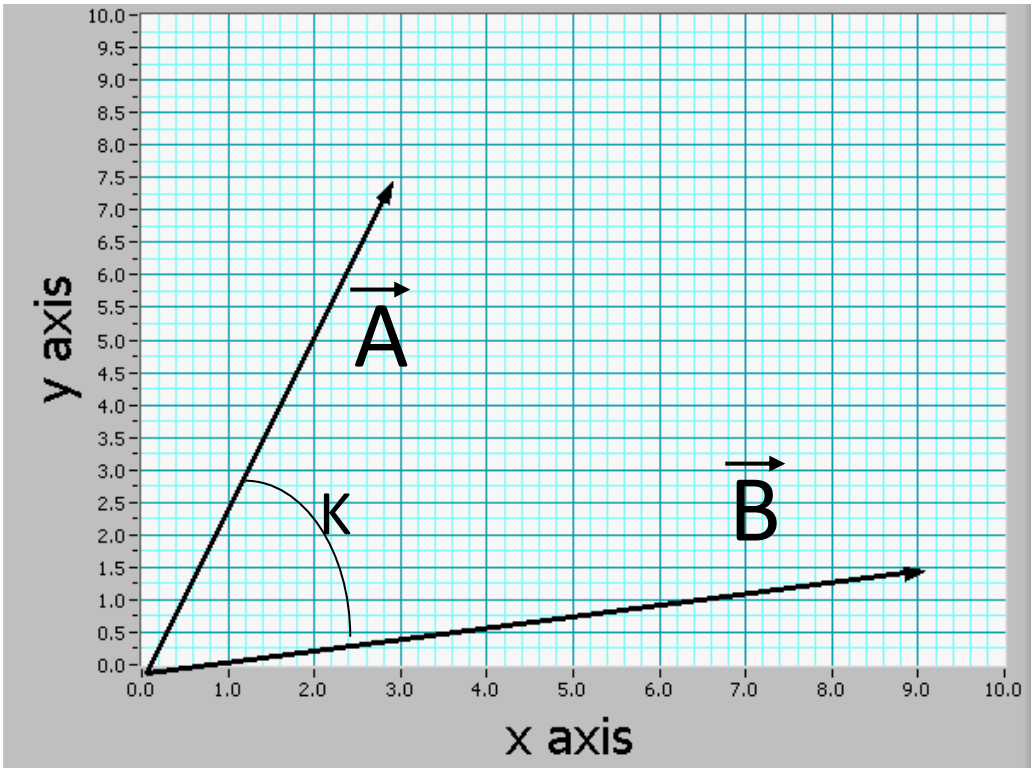
7/ Calculate the dot product of the vectors $\vec{A} = 4\vec{x} + 7\vec{y}$ and $\vec{B} = \vec{x} - 3\vec{y}$.

[-17]

8/ Calculate the dot product of two vectors of length 3.5 and 8 units where the angle between them is 60˚.

[14]

9/ For the two vectors shown below:



- Calculate their components, A_x, A_y, B_x, and B_y.
- Calculate their dot product, $\vec{A}.\vec{B}$.
- Calculate the magnitude of $\vec{A}$.
- Calculate the magnitude of $\vec{B}$.
- Calculate the cosine of the angle between $\vec{A}$ and $\vec{B}$.
- Calculate the angle, K, between $\vec{A}$ and $\vec{B}$.

[(3, 7.5) and (9,1.5), 38.25, 8.0777, 9.124, 0.519, 58.74˚]

10/ Two vectors have length of 3 and 5 units. What is the maximum value of their dot product? What angle between these vectors gives this maximum value?