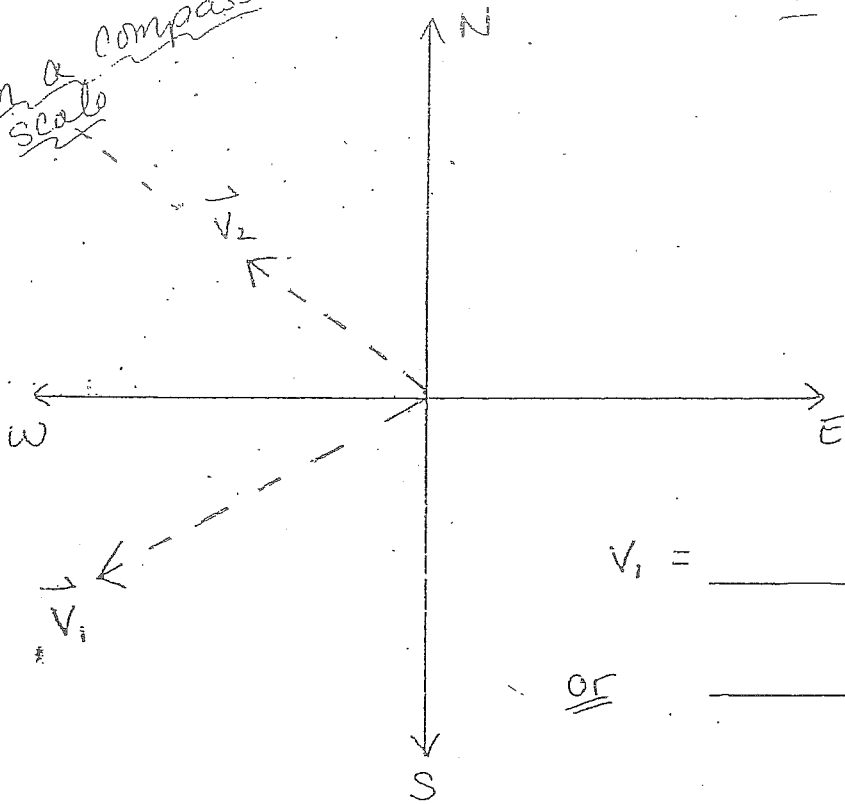


The Language of Vectors!

Expressing Magnitudes and Directions

In a compass
scale



Scale: 1.0cm = 3.0m/s

$$v_1 = \underline{\hspace{2cm}} \text{ m/s } [\hspace{1cm}]$$

or

$$\underline{\hspace{2cm}} \text{ m/s } [\hspace{1cm}]$$

$$v_2 = \underline{\hspace{2cm}} \text{ m/s } [\hspace{1cm}]$$

or

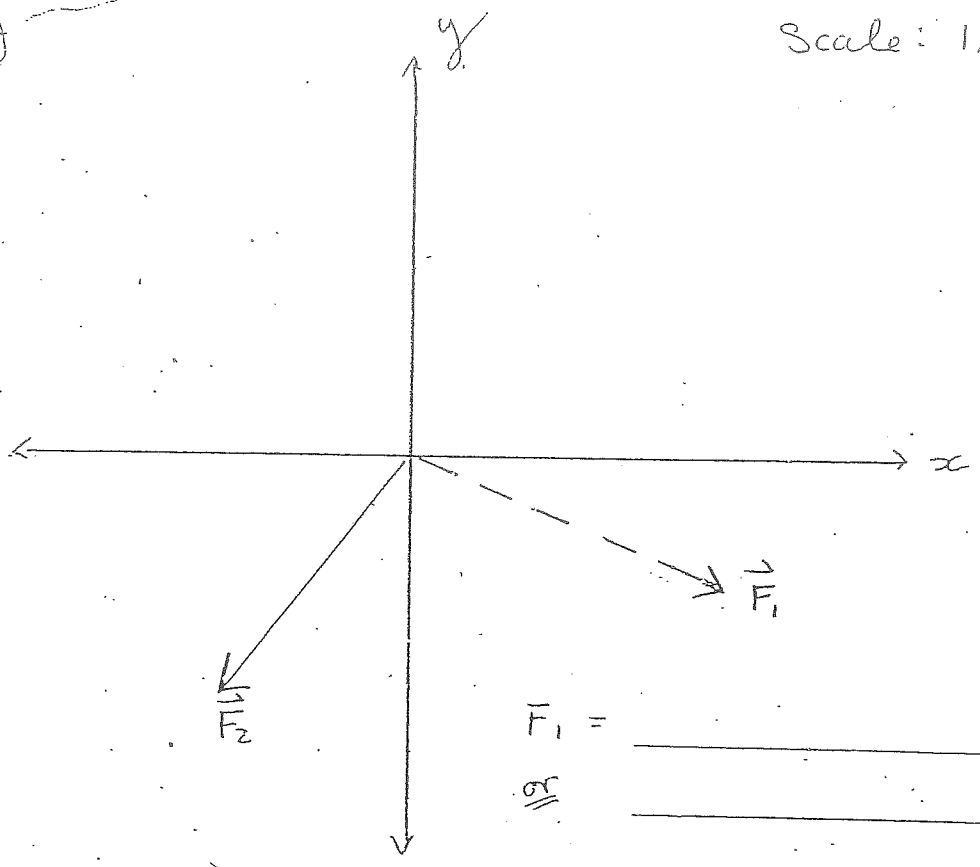
$$\underline{\hspace{2cm}} \text{ m/s } [\hspace{1cm}]$$

$$\vec{v}_1 + \vec{v}_2 = ?$$

$$\vec{v}_1 - \vec{v}_2 = ?$$

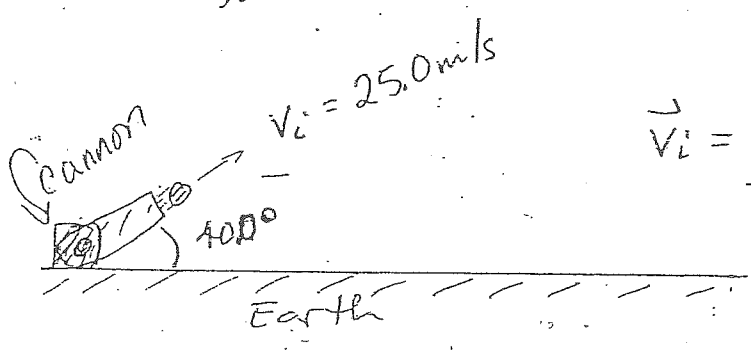
on an $x-y$ axis

Scale: 1.0cm = 2.0N

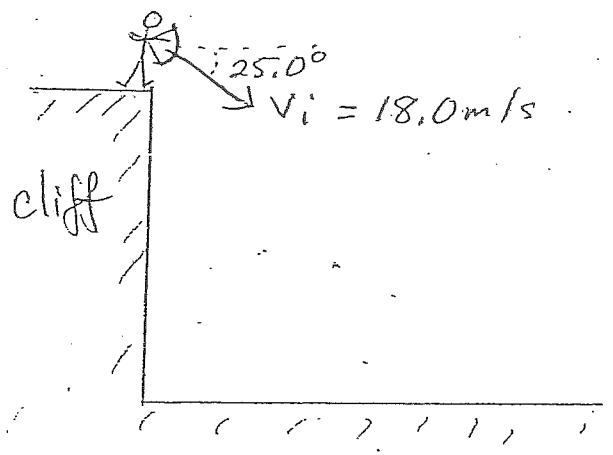


$F_1 =$ _____
 or _____
 $F_2 =$ _____
 or _____

on the ground, launching into air



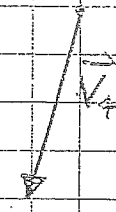
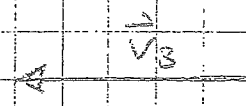
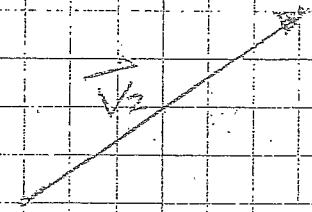
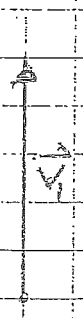
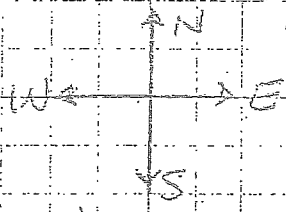
$v_i =$ _____



$v_i =$ _____

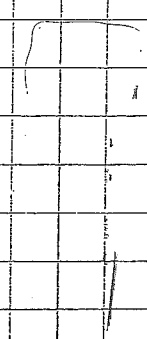
Vectors - GRAPHICAL METHODS of addition

1. Use Scale diagrams to determine the resultant vector in the following examples. (1 unit = 1 side length of square)
 * For these questions use compass directions



Use GRAPHICAL METHODS (diagram) to determine the resultant

(a) $\vec{V}_1 + \vec{V}_2 + \vec{V}_3$ Resultant:



Note: Vectors must be expressed with both magnitude and direction.
 Resultant: 25 km [36° N of E] direction

(b)

$$\vec{V}_2 - \vec{V}_4 + \vec{V}_1$$

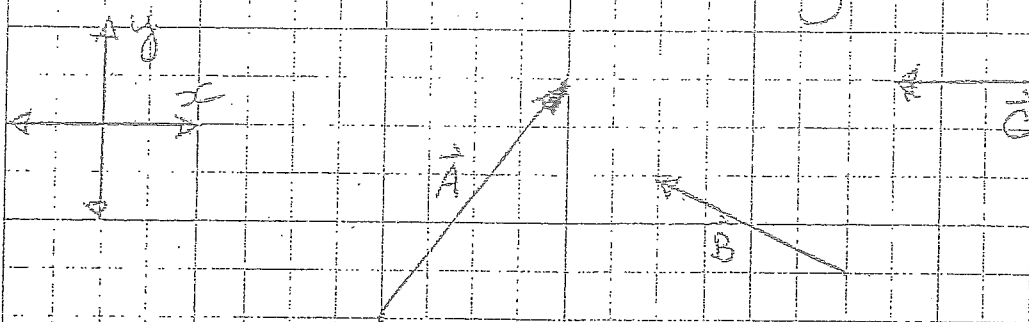
Resultant:

(c)

$$2\vec{V}_1 + \vec{V}_3 - 2\vec{V}_4$$

Resultant:

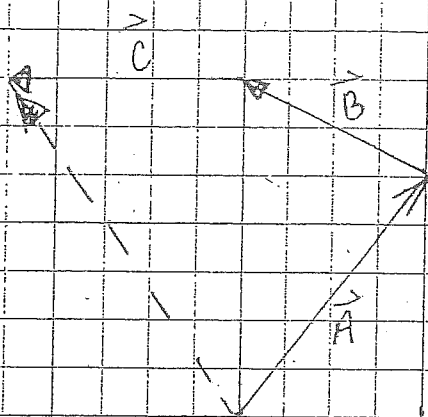
2. Use scale diagrams and the x-y axis to determine the following resultants.



(a) $\vec{A} + \vec{B} + \vec{C}$

Resultant:

8.8 units $\left\{ \begin{array}{l} 36^\circ \text{ to the left} \\ \text{of the } +y \text{ axis} \end{array} \right.$



(b) $\vec{C} - \vec{A} + 2\vec{B}$

Resultant:

3. Use a ruler and protractor to create a scale diagram representing the following situation. Use the ruler and protractor to determine the magnitude and direction of the resultant vector.
(you must create a scale. ... eg 1cm : 1km)

A marathon runner in training runs 10.0 km [30.0° North of East], then turns and runs 3.0 km [due East]. Finally, she runs 15.0 km [40.0° West of North].

What is her ~~total~~ (resultant) displacement?