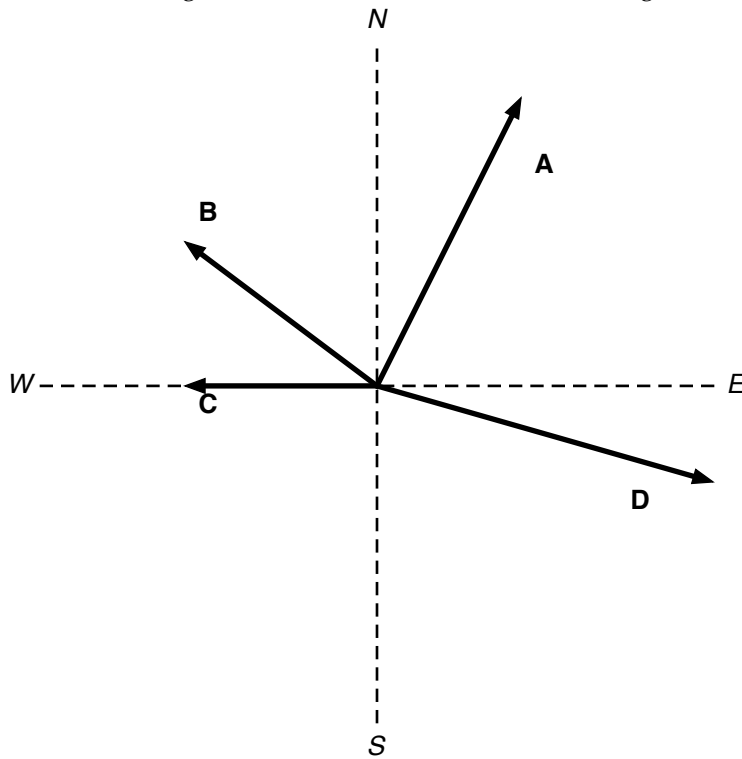
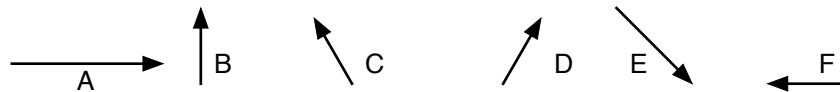


## Vector Review

1. Measure the magnitudes and directions of the following vectors:



2. Draw the following vectors in the diagram above:  
**E** = 5 cm @ 30° N of E      **F** = 8 cm @ 30° W of S      **G** = 5 cm E
3. Make reasonable sketches that shows **A + B** and **B + C**. Make sure to label the vectors and clearly show the resultants.  
**A** = 100 km, 20° North of East.      **B** = 60 km, 60° North of West      **C** = 40 km, 35° South of West



4. Using the vectors above, show the following (and make sure to label the vectors and clearly show the resultants):  
 a) **A + B**      b) **A + F**      c) **B + E**      d) **E + F**      4) **A + B + F**

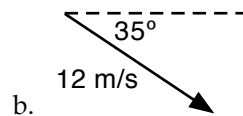
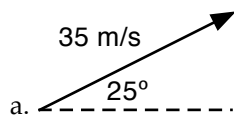
### Vector Review

5. Calculate the speeds of the velocities with the given components:

a.  $v_x = 12 \text{ m/s}$      $v_y = 20 \text{ m/s}$

b.  $v_x = 15 \text{ m/s}$      $v_y = -15 \text{ m/s}$

6. Calculate the components of each of the velocities shown:



$v_x = \underline{\hspace{2cm}}$  m/s

$v_x = \underline{\hspace{2cm}}$  m/s

$v_y = \underline{\hspace{2cm}}$  m/s

$v_y = \underline{\hspace{2cm}}$  m/s

c. A ball is kicked with a velocity of 25 m/s at an angle of 65° above the horizontal.

$v_x = \underline{\hspace{2cm}}$  m/s

$v_y = \underline{\hspace{2cm}}$  m/s

d. A pen is thrown with an initial velocity of 15 m/s at an angle of 25° below the horizontal.

$v_x = \underline{\hspace{2cm}}$  m/s

$v_y = \underline{\hspace{2cm}}$  m/s

7. Draw the following vectors and calculate their magnitudes:

A)  $A_x = 4$   $A_y = 2$

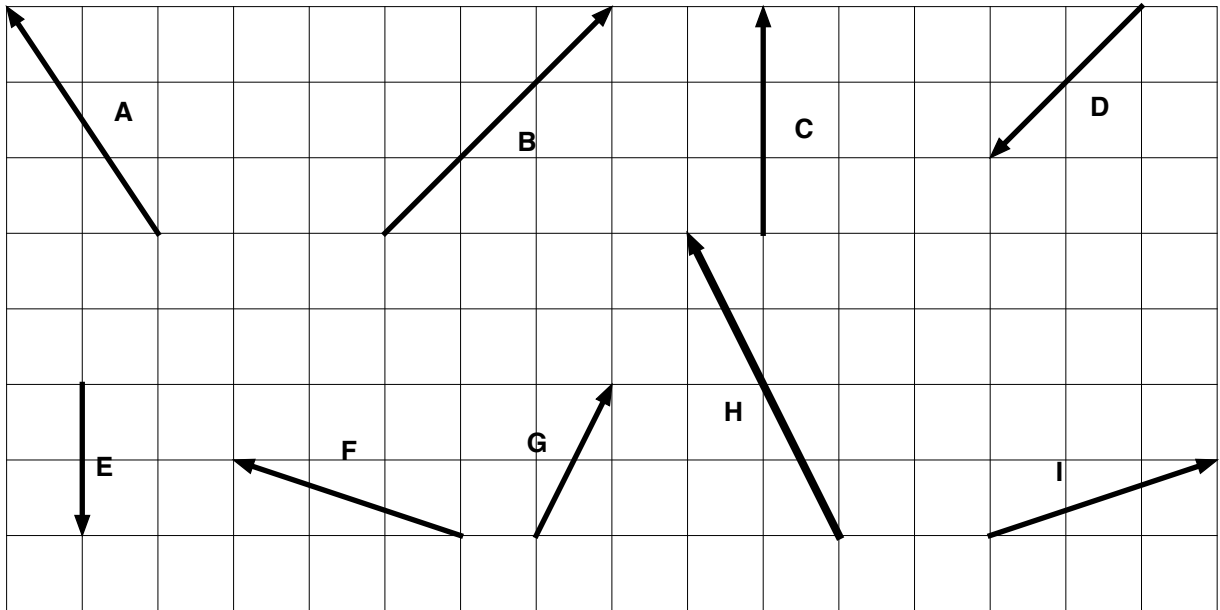
B)  $B_x = 3$   $B_y = -2$

C)  $C_x = -2$   $C_y = 5$

D)  $D_x = 3$   $D_y = 4$

## Vector Review

8. Show the components of the following vectors and then give the components below the diagram.



$A_x = \underline{\hspace{1cm}}$  &  $A_y = \underline{\hspace{1cm}}$

$B_x = \underline{\hspace{1cm}}$  &  $B_y = \underline{\hspace{1cm}}$

$C_x = \underline{\hspace{1cm}}$  &  $C_y = \underline{\hspace{1cm}}$

$D_x = \underline{\hspace{1cm}}$  &  $D_y = \underline{\hspace{1cm}}$

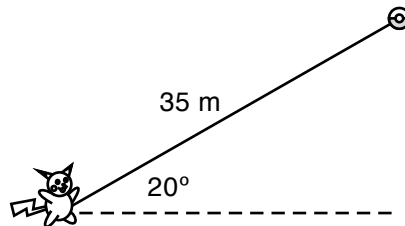
$E_x = \underline{\hspace{1cm}}$  &  $E_y = \underline{\hspace{1cm}}$

$F_x = \underline{\hspace{1cm}}$  &  $F_y = \underline{\hspace{1cm}}$

$G_x = \underline{\hspace{1cm}}$  &  $G_y = \underline{\hspace{1cm}}$

$H_x = \underline{\hspace{1cm}}$  &  $H_y = \underline{\hspace{1cm}}$

$I_x = \underline{\hspace{1cm}}$  &  $I_y = \underline{\hspace{1cm}}$



9. Pikachu sees a Pokeball 35 meters away, as shown in the diagram above (which is NOT to scale.) He runs straight to the Pokeball in 9 seconds.

- a. How fast did Pikachu move?
  
- b. What are the components of Pikachu's displacement?
  
- c. What are the components of Pikachu's velocity?

## Vector Review

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10. A plane has a velocity made of a horizontal component of 35 m/s East and a vertical component of 20 m/s North. After 2 hours, how far away is it from its starting point?
11. A river flows due West with a current of 4 m/s. A boater can always travel with a water speed of 7 m/s.
- What is the fastest resultant velocity the boater can have? In what direction must she point the boat?
  - What is the slowest resultant velocity the boater can have? In what direction must she point the boat?
  - If she points her boat due North, what is her resultant speed? Include a sketch showing how the vectors add.
  - If she points her boat due North, and the river is 150 meters across, how long will it take her to cross the river?
  - From part c and d, she drifted West with the current. How far West did she drift?