IN 2018 E.C GAMO BAYRA BOARDING SECONDARY SCHOOL
PHYSICS WORK SHEET 1 FOR GRADE 10thA-D(CHAPTER ONE)

1. The magnitude of vector is 35.0 units and points in the direction 325° counterclockwise from the positive x-axis. Calculate the x- and y-components of this vector.
2. 2. A boy ran 3 blocks west, 5 blocks north. Find the magnitude and direction of his resultant displacement with reference to East.
3. The rectangular components of four vectors are given below. Find the magnitude and direction of each vector.

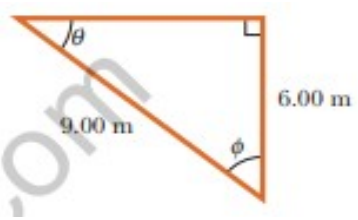
Vector	x-component	y-component
A	3 units	-4 units
B	5 units	1 unit
C	-2 units	-3 units
D	-12 units	6 units

4. On a certain day, a student goes to school by first walking 2.0 km 45° north of east from her home to her ant's home to drop a message. Then she walks 0.8 km in a direction 60° south of east of north where her school is located.
   a. Determine the components of the student's displacements in the first and second parts of her walk.
   b. Determine the components of her total displacement for the trip from home to school.
   c. Find the direction of the resultant

5. Two vectors A and B have magnitude of 100 units and 120 units respectively. Find
   a. The maximum resultant vector
   b. The minimum resultant vector

6. The resultant of two equal vectors in magnitude is the same as in magnitude as one of the vector. What is the angle between two vectors?
7. The x and y component of vector A are 8 and 12 units respectively. If the vector B is added to A, then the resultant vector has magnitude of 65 along the positive y direction. Determine
   a. The x and y component of vector B.
   b. The magnitude and direction of vector B.
8. Two vectors A and B have the same magnitude of 5 units and they start from the origin: B points to the North East and A points to the South West exactly opposite to vector B. What would be the magnitude of the resultant vector? Why?

9. If two vectors have equal magnitude, what are the maximum and minimum magnitudes of their sum?
10. If three vectors have unequal magnitudes, can their sum be zero? Explain.
11. Consider six vectors that are added tail-to-head, ending up where they started from. What is the magnitude of the resultant vector?
12. If $v_x = 9.8$ m/s and $v_y = 6.4$ m/s, determine the magnitude and direction of v.
13. For the right triangle shown in Figure below, what are
(a) The length of the unknown side, (c) The sine of ϕ?
(b) The tangent of θ, and



14. What would be the angle b/n two vectors A and B of equal magnitude for the resultants of their difference to be equal to magnitude of A?

15. An aircraft is travelling due North with a velocity of 100 m/s. A strong wind blows from the West with a velocity of 25 m/s. Find the resultant velocity.

16. A velocity of magnitude 40 m/s is directed at an angle of 40° East of North. Draw a vector on paper to represent this velocity.

17. Two forces, one of 12 N and another of 24 N, act on a body in such a way that they make an angle of 90° with each other. Find the resultant of the two forces.

18. Calculate the component of a force of 200N at a direction of 60° to the force.

19. At what angle should the two force vectors 5N and 12 N be added to get a resultant vector of 13 N?

a. 0^0 b. 30^0 c. 90^0 d. 180^0

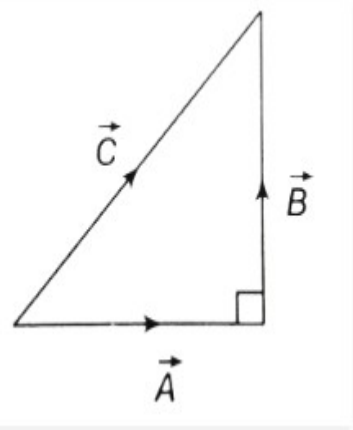
20. What is the net force on the particle if it is simultaneously acted upon by two forces 4 N and 3 N?

A. 1N B. 7 N C.21 N D. between 7 N and 1 N

21. If the magnitude of the resultant force of two forces is lesser than the magnitude of the larger force, then

A. The two forces are perpendicular to each other
B. They two forces in opposite directions
C. The forces are different in magnitude and direction
D. The forces possess small magnitude

22. Which of the following is true for the given diagram?



a. $\vec{A} + \vec{B} = \vec{C}$
b. $\vec{C} + \vec{A} = \vec{B}$
c. $\vec{B} + \vec{C} = \vec{A}$
d. $\vec{A} + \vec{B} + \vec{C} = 0$

23. For a vector quantity, which of the following is true?
A. It just has the magnitude
B. It has only the direction
C. It has both the magnitude as well as the direction
D. None of the mentioned

24. What will be the vertical component of a force of 5 N acting on a particle in a 60° angle?

A. 3 N B. 2.5N
C. 10N D.4N

25. What will be the y-component of the same applied force if the x-component of a force of 50N is 30N?

A. 20N B.40N
C.45N D.25N

26. The angle formed by the vector (1,1) with respect to the x-axis is:

A. 90° B. 45°
C. 22.5° D. 30°

27. If the initial and terminal points of a vector are coincident then the vector is called as:

A. Zero vector B. Free vector
C. Unit vector D. Equal vector

28. Using trigonometric ratios, for a right angle triangle tanθ is equal to

A. Perpendicular/Hypotenuse B. Base/Hypotenuse

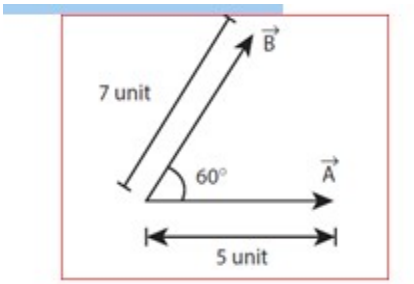
C. Hypotenuse / Base D. Perpendicular / Base

29. The splitting of vectors into two components is called

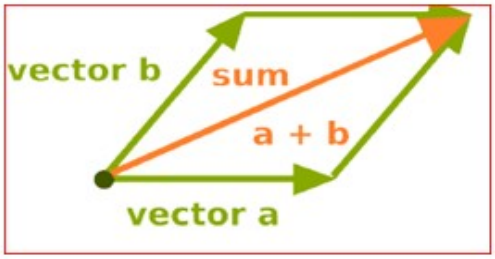
A. addition of vectors B. resolution of vectors

C. division of vectors D. multiplication of vectors

30. Two vectors *A* and *B* of magnitude 5 units and 7 units respectively make an angle 60° with each other as shown below. Find the magnitude of the resultant vector and its direction with respect to the vector *A*.in below figure



31. The figure below shows what method of vector addition



32.

4.) Which one of the following is not a vector quantity:

A velocity **B** force **C** energy **D** momentum

5.) A girl runs once around a circular track with a radius of 65m at a speed of 2m/s. Her displacement is:

A 0 **B** 65m west **C** 65m east **D** 130m

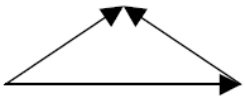
33.

7.) In which of the following vector diagrams is the resultant of the three vectors zero?

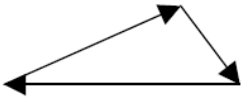
A



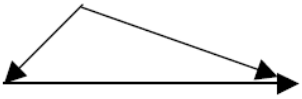
B



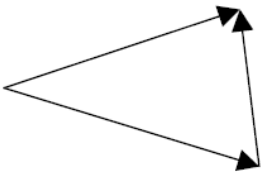
C



D



E



34.

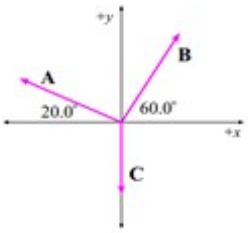
10.) A force of magnitude F acts at an angle α to the horizontal. The magnitude of the horizontal component of the force is …

A F cos α **B** F sin α **C** F sin $(90^0 - \alpha)$ **D** 0

35. A force vector points at an angle of 52^0 above the +x axis. It has a y component of +290N. Find

(a) the magnitude and (b) the x component of the force vector.

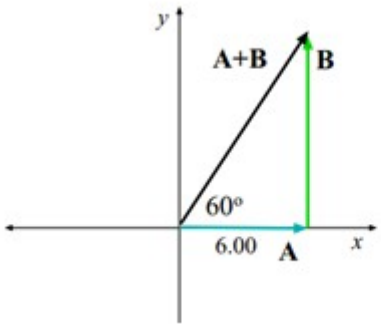
36. Find the resultant of the three displacement vectors in Fig below by means of the component method. The magnitudes of the vectors are A = 5.00 m, B = 5.00 m and C = 4.00 m.



37. Vector A has a magnitude of 6.00 units and points due east. Vector B points due north.

(a) What is the magnitude of B, if the vector A+B points 60.0◦ north of east?

(b) Find the magnitude of A + B.



38.

The polar coordinates of a point are $r = 5.50$ m and $\theta = 240°$. What are the Cartesian coordinates of this point?

39. Use the component rule to determine the resultant velocity of the following two velocities:
a. Velocity A, 30 m/s at an angle of 45° to the horizontal.

b. Velocity B, 40 m/s at an angle of 80° to the horizontal.

40. The magnitude of the resultant of two vectors acting in the same direction is 20 units and when the vectors are in opposite direction their resultant is 6 units. Find

a. The magnitude of two vectors

b. The magnitude of the resultant vectors when they are at right angles.

41. Two forces of magnitude 20 N and 50 N acts simultaneously on a body. Which one of
the following forces cannot be a resultant of the two forces?

A	20 N
B	30 N
C	40 N
D	70 N

42. The resultant of four forces is 1000N in the direction of 30^0 above x-axis in the 1^{st} quadrant. Three of forces are 400N, 60^0 above the negative x-axis in the 2^{nd} quadrant, 300N along the negative y-axis and 400N, 53^0 below x-axis in the 4^{th} quadrant. Find the rectangular component of the fourth force.

PREPARED BY AYELE DIBABA

NOVEMEMBER 2/2018 E.C