ASTU Special School Physics Grade 10 Unit 1 Worksheet in 2017

CHOOSE THE CORRECT ANSWER FROM THE GIVEN ATERNATIVES

1. Which of the following conditions is true for equal vectors? ⟹JOIN: *https://t.me/megyc*
   A. They are parallel to the same line
   B. They have the same direction but not the same magnitude
   C. They have the same magnitude and direction
   D. They have the same initial point
2. What is the magnitude of a vector that makes an angle of 30° to the horizontal and whose x-component is 3 units?
   A. 2.61 units B. 3.00 units C. 3.46 units D. 6.00 units
3. Which one of the following represents a scalar quantity?
   A. The change in momentum of a rubber ball bouncing off the floor.
   B. The velocity of an airplane flying at 300 km/h on a bearing of 40°.
   C. The speed of a car travelling at 100 km/h.
   D. The acceleration of an object thrown vertically upwards and which has reached the highest point of its motion.
4. Which of the following groups consists only of vectors?
   A. Displacement, velocity, pressure B. Momentum, force, velocity
   C. Displacement, force, speed D. Force, acceleration, temperature
5. What is vector resolution?
   A. Combining two or more vectors to form a resultant vector.
   B. Breaking a vector into its components along the coordinate axes.
   C. Measuring the magnitude and direction of a vector.
   D. Calculating the displacement of a vector.
6. If a vector has a magnitude of 10 units and makes a 30° angle with the horizontal, what is the magnitude of its vertical component?
   A. 5 units B. 8.66 units C. 10 units D. 7.5 units
7. A vector is resolved into components along the x and y axes. What is true about the components?
   A. They are always of equal magnitude.
   B. They are dependent on the angle made by the vector with the axes.
   C. The x-component is always larger than the y-component.
   D. The components are independent of the vector's direction.
8. Which of the following pairs of components would correctly resolve a vector of magnitude 15 units making a 45° angle with the horizontal?
   A. 15 units along x, 15 units along y B. 10.6 units along x, 10.6 units along y
   C. 12 units along x, 9 units along y D. 8 units along x, 13 units along y
9. What is the first step in the graphical method of vector addition?
   A. Measure the magnitude of each vector.
   B. Draw vectors to scale with appropriate directions.
   C. Find the resultant vector algebraically.
   D. Convert vectors to unit vectors.

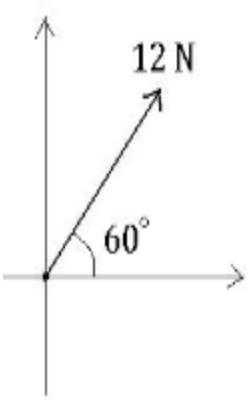
10. In the graphical method of vector addition, how is the resultant vector determined?
    A. By drawing the vectors from a common origin and measuring the total length.
    B. By placing the tail of one vector at the head of the previous vector.
    C. By calculating the vector components and adding them algebraically.
    D. By finding the midpoint between the two vectors.
11. When using the graphical method, what is the "head-to-tail" rule?
    A. Draw each vector from the head of the previous vector.
    B. Draw each vector from the tail of the previous vector.
    C. The vectors should form a closed triangle.
    D. Draw vectors such that the tail of one vector connects to the head of another.
12. In the graphical method, the resultant vector is represented as:
    A. The vector that starts at the origin and ends at the last head.
    B. The vector that connects the starting point of the first vector to the endpoint of the last vector.
    C. The average of the vectors' magnitudes.
    D. The midpoint of the vectors' directions.
13. If two vectors are represented graphically and placed head-to-tail, what does the line from the tail of the first vector to the head of the second represent?
    A. The average of the two vectors. B. The difference between the two vectors.
    C. The resultant vector. D. The equilibrium vector.
14. What happens to the resultant vector's magnitude if two vectors of equal magnitude are added at an angle of 90° using the graphical method?
    A. It doubles. B. It becomes zero.
    C. It becomes $\sqrt{2}$ times the magnitude of one vector. D. It stays the same as one vector.
15. When adding two vectors graphically using the parallelogram method, the diagonal of the parallelogram represents:
    A. The vector difference. B. The average vector.
    C. The resultant vector. D. The equilibrium vector.
16. If vector A is 5 units long and vector B is 5 units long, and they are added graphically head-to-tail at a 120° angle, the magnitude of the resultant vector will be closest to:
    A. 5 units B. 8.66 units C. 10 units D. 2.5 units
17. Why is a scale factor important in the graphical method of vector addition?
    A. It allows for an accurate calculation of the angles between vectors.
    B. It ensures vectors are drawn in the correct order.
    C. It ensures that the vectors' lengths represent their magnitudes accurately.
    D. It simplifies converting vectors to their components.
18. What is a zero vector?
    A. A vector with a magnitude of one
    B. A vector with a magnitude of zero and no specific direction
    C. A vector with opposite direction to another vector
    D. A vector that has both magnitude and direction

19. Which type of vectors have the same magnitude but opposite directions?
    A. Equal vectors B. Unit vectors C. Negative vectors D. Collinear vectors
20. Two vectors are said to be equal if:
    A. They have the same magnitude and direction.
    B. They lie along the same line.
    C. Their magnitudes are different but directions are the same.
    D. They form a right angle.
21. What is a position vector?
    A. A vector that specifies the position of a point relative to the origin.
    B. A vector with a fixed magnitude of one unit.
    C. A vector with no magnitude.
    D. A vector used to represent forces.
22. Which vectors lie along the same line or parallel lines, regardless of magnitude?
    A. Coplanar vectors B. Collinear vectors C. Orthogonal vectors D. Displacement vectors
23. If vectors have the same magnitude and direction, they are called:
    A. Opposite vectors B. Equal vectors C. Perpendicular vectors D. Non-coplanar vectors
24. What are coplanar vectors?
    A. Vectors that lie along the same line B. Vectors that lie in the same plane
    C. Vectors that is perpendicular to each other D. Vectors with the same magnitude
25. When are vectors said to be orthogonal?
    A. When they lie in the same plane B. When they are parallel to each other
    C. When they are at right angles (90°) to each other D. When their magnitudes are equal
26. What distinguishes a vector quantity from a scalar quantity?
    A. A vector has only magnitude, while a scalar has both magnitude and direction.
    B. A vector has both magnitude and direction, while a scalar has only magnitude.
    C. A scalar can be negative, while a vector is always positive.
    D. A scalar is always represented graphically, while a vector is not.
27. A displacement vector of 10 meters makes an angle of 60° with the horizontal. What is the vertical component of this displacement?
    A. 5 m B. 8.66 m C. 10 m D. 6 m
28. A vector is resolved into two perpendicular components: 6 units along the x-axis and 8 units along the y-axis. What is the magnitude of the original vector?
    A. 10 units B. 14 units C. 8 units D. 12 units
29. If a vector has a magnitude of 20 units and makes a 45° angle with the x-axis, what is the magnitude of its y-component?
    A. 14.14 units B. 10 units C. 20 units D. 17.32 units
30. What is the smallest number of distinct magnitude coplanar vectors that can be joined to yield a consequent of zero?
    A. 1 B. 2 C. 3 D. 4

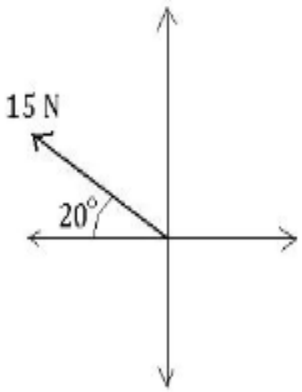
31. What is the triangle method of vector addition?
    A. Adding vectors by placing them tail-to-tail.
    B. Adding vectors by placing the tail of one vector at the head of another.
    C. Adding vectors by finding the midpoint between them.
    D. Adding vectors by forming a parallelogram.
32. When using the triangle method to add two vectors, the resultant vector is represented as:
    A. The vector that connects the tail of the first vector to the head of the second vector.
    B. The average of the two vectors' magnitudes.
    C. A vector that bisects the angle between the two original vectors.
    D. The difference between the two vectors.
33. If two vectors are added using the triangle method and form a right triangle, how can the magnitude of the resultant vector be calculated?
    A. Using the sine rule. B. By simply adding the magnitudes of the two vectors.
    C. Using the Pythagorean Theorem. D. By finding the average of the magnitudes.
34. Which condition must be satisfied to use the triangle method effectively for vector addition?
    A. The vectors must be perpendicular to each other.
    B. The vectors must have the same magnitude.
    C. The tail of one vector must be placed at the head of the previous vector.
    D. The vectors must be collinear.

ANSWER THE FOLLOWINGS ACCORDINGLY

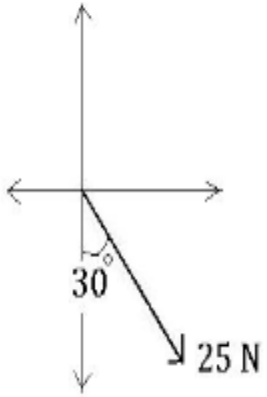
1. Determine the x and y components of each of the force vectors below



(a)



(b)



(c)