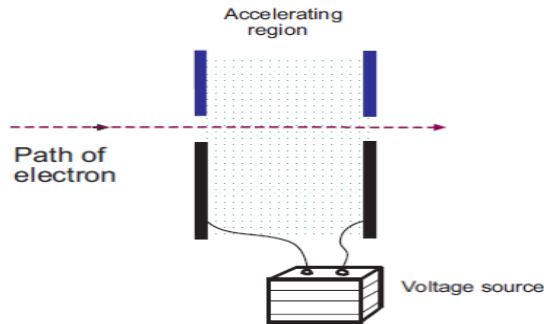


General Physics Worksheet One



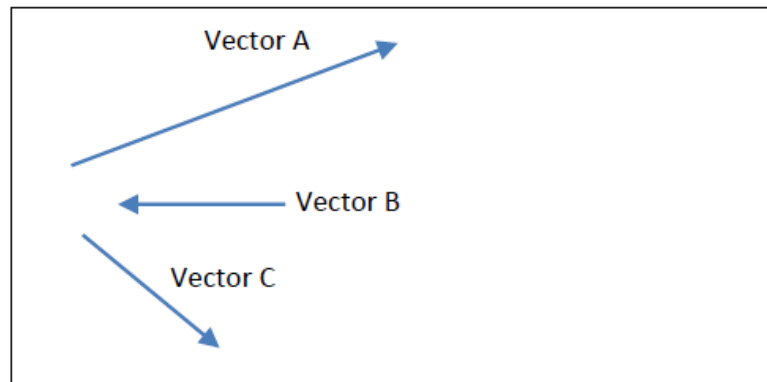
1. A rectangular building lot is 100.0 ft by 150.0 ft. Determine the area of this lot in m^2 with appropriate significant figure?
2. The Earth is approximately a sphere of radius $6.37 \times 10^6 \text{ m}$. (a) What is its circumference in kilometers? (b) What is its surface area in square kilometers? (c) What is its volume in cubic kilometers?
3. One gallon of paint (volume = $3.78 \times 10^{-3} \text{ m}^3$) covers an area of 25.0 m^2 . What is the thickness of the paint on the wall?
4. A certain brand of house paint claims a coverage of $460 \text{ ft}^2/\text{gal}$. (a) Express this quantity in square meters per liter. (b) Express this in SI base units. (c) What is the inverse of the original quantity, and what is its physical significance?
5. Vector A has magnitude 5.0m and is directed east. Vector B has magnitude 4.0m and is directed 35° west of north. What are (a) the magnitude and direction of $A + B$? (b) what are the magnitude and direction of $B - A$? (c) draw a vector diagram for each combination. (d) Put $A + B$ and $A - B$ in unit vector form.
6. If $a - b = 2c$, $a + b = 4c$ and $c = 3i + 4j$, then what are a and b?
7. If $A = (6.0i - 8.0j)$ units, $B = (-8.0i + 3.0j)$ units, and $C = (26.0i + 19.0j)$ units, determine a and b so that $aA + bB + C = 0$.
8. A vector B, when added to the vector $C = 3.0i + 4.0j$, yields a resultant vector that is in the positive y direction and has a magnitude equal to that of C. What is the magnitude of B?
9. The head of a rattlesnake can accelerate 50 m/s^2 in striking a victim. If a car could do as well, how long would it take to reach a speed of 100 km/h from rest?
10. An electron with initial velocity $v_o = 1.50 \times 10^5 \text{ m/s}$ enters a region 1.0 cm long where it is electrically accelerated, as shown in the figure below. It emerges with velocity $v = 5.70 \times 10^6 \text{ m/s}$. what was its acceleration, assumed constant? (such a process occurs in the electron gun in a cathode ray tube, used in

television receivers and oscilloscopes.)



- the acceleration of the electron is constant
 -
11. With what speed must a ball be thrown vertically from ground level to rise to a maximum height of 50 m? How long will it be in the air?
 12. A student throws a set of keys vertically upward to her friend in a window 4.00 m above. The keys are caught 1.50 s later by the friend's outstretched hand. (a) With what initial velocity were the keys thrown? (b) What was the velocity of the keys just before they were caught?
 13. A ball is thrown with a speed of 25.0 m/s at an angle of 40.0° above the horizontal directly toward a wall. The wall is 22.0 m from the release point of the ball. (a) How long does the ball take to reach the wall? (b) How far above the release point does the ball hit the wall? (c) What are the horizontal and vertical components of its velocity as it hits the wall? (d) When it hits, has it passed the highest point on its trajectory?
 14. The launching speed of a certain projectile is five times the speed it has at its maximum height. Calculate the elevation angle at launching.
 15. Do heavier objects fall more slowly than lighter objects? Explain.
 16. When a moving car encounters a patch of ice the brakes are applied. Why is it desirable to keep the wheels rolling on the ice without locking up?
 17. When an electron revolves around a nucleus, it always keeps its trajectory without slipping. What prevents the electron not to take spiral path and stick to the nucleus (Note: the force acting between is Weak nuclear force)? The same is true for Earth when revolving around the Sun (Gravitational force).

18. Fig. represents three vectors A, B and C. Draw a sketch diagram for the given vectors to represent a vector D as the sum of the three vectors A, B and C.



19. In a simple electrical circuit, two measurements are made as $a = 2.50 \pm 0.05$ and $b = 4.7 \pm 0.1$. What will be the uncertainty for i) $a + b$ and ii) a/b ?
20. A vector quantity V is resolved into two perpendicular components X and Y . The angle between V and component X is θ as shown below. The angle between component X and the vector V is increased from 0° to 90° . How do the magnitudes of X and Y change as the angle θ is increased in this way?