

EXERCISES

Try to do each task in less than 4 minutes

1. A particle moves from A to B. Vector position of A and B are $\mathbf{r}_A = 3\mathbf{i} + \mathbf{j}$ and $\mathbf{r}_B = 11\mathbf{i} + 7\mathbf{j}$ respectively. Determine the magnitude and the direction of the displacement that is done by the particle!
2. A cat runs on across a parking lot where a coordinate drawn on it. The position of the cat is expressed by $\mathbf{r} = (2t^2 + 1)\mathbf{i} + (3t - 4)\mathbf{j}$. Find the velocity of the cat and its magnitude at $t = 1$ s!
3. Initial position of a rat is at (2,3). After moving for 10 s, its position is at (7,15). Find the average velocity of the rat during that interval of time!
4. A particle moves on a plane and its position is expressed by $x = 3t^2 + 4$ and $y = 2t^3 + t^2 + 7$. Find the velocity of the particle at $t = 2$ s!
5. A particle travels along x axis and its position is expressed by $x = 10t^3 + 5t^2 + 2t + 1$ where x is in meter. Find position of the particle when its velocity is 142 m/s!
6. A car moves on a straight line and its velocity is expressed by $v = (2t + 3)$ m/s. at $t = 0$ s the car is at origin. Find the distance that is covered by the car after moving for 2 s!
7. A stone is thrown vertically with a certain velocity. Its instantaneous position above the ground is expressed by $y = 10t - 5t^2$. Find :
 - a. Initial velocity of the stone
 - b. The time that is needed to reach the highest point
 - c. The highest point that can be reached by the stone
8. An electron is initially moving at the velocity of 100 m/s. As the force exerted on it, the electron is decelerated and its deceleration is expressed by $a = (2 - 10t)$ m/s². Find the velocity of the electron after the force is exerted for 4 s!