3. A force of $20N$ is applied to a body of mass $10kg$, initially at rest on a smooth horizontal surface for a time of $5sec$. Calculate
   a. The final velocity   [Ans: $10m/s$]
   b. The distance travelled   [Ans: $25m$]
   c. The work done   [Ans: $500J$]
4. A horse is towing a canal boat, the tow rope making an angle of 10^0 with the tow path. If the tension in the rope is $20N$, how many joules of work are done while moving $50m$ tow path?   [Ans: $984.8J$]
5. A $0.15kg$ glider is moving to the right on a frictionless horizontal air track with a speed of $0.80m/s$. It has a head on collision with a $0.30kg$ glider that is moving to the left with a speed of $2.2m/s$. Find the final velocity of each glider if the collision is elastic.   [Ans: $-3.2m/s\ and\ -0.2m/s$]
6. Calculate the energy of,
   a. A 2kg object moving horizontally with a velocity of $10m/s$.   [Ans: $100J$]
   b. A 10kg object held stationary 5m above the ground.   [Ans: 500J]
7. A ball of mass $0.1kg$ is thrown vertically upwards with a velocity of $20m/s$. What is the potential energy at the maximum height? What is the potential energy of the ball when it reaches three quarters of the maximum height while moving upwards?   [Ans: $20J\ and\ 15J$]
8. A $1kg$ object moving with velocity $4m/s$ collides with a stationary object of mass $2kg$. Assuming that the collision is perfectly elastic, Calculate the velocity of each object after the collision.   [Ans: $-1.34m/s\ \&\ 2.67m/s$]
9. A bomb explodes into two parts of masses $6kg\ \&\ 2kg$ respectively. If the combined kinetic energy of the two parts be $4.8 \times 10^3 J$, find the combined kinetic energy of each part.   [Ans: $1200J\ \&\ 3600J$]
10. A water reservoir tank of capacity 250 m³ is situated at a height of 20 m from the water level. What will be the power of an electric motor to be used to fill the tank in 3 hours? Efficiency of motor is 70%.   [Ans: $6614watt$]
11. You throw a 20 N rock vertically into the air from ground level. You observe that when it is 15 m above the ground, it is travelling at 25 m/s upward. Use the work-energy theorem to find (i) its speed as it left the ground and (ii) its maximum height.   [Ans: $30.41m/s, 46.25m$]
12. A 650 KW power engine of a vehicle of mass $1.5x\ 10^5\ Kg$ is rising on an inclined plane of inclination 1 in 100 with a constant speed of 60 km/hr. Find the frictional force between the wheels of the vehicle and the plane.   [Ans: $7.7m/s$]
13. A block of weight 150N is pulled 20m along a horizontal surface at constant velocity. Calculate the work done by the pulling force if the coefficient of Kinetic friction is 0.20 and the pulling force makes an angle of $60°$ with the vertical.   [Ans: $537.9J$]
14. A bullet of mass $20gm$ travelling horizontally at $100m/s$ embeds itself in the center of a block of wood of mass $1kg$, which is suspended by a light vertical string of $1m$ length. Calculate the maximum inclination of the string to the vertical.   [Ans: 35.9^0]

Graphical type Questions:

1. Force versus displacement curve is shown in the diagram. Find the change in kinetic energy by the force at the end of 30 m.
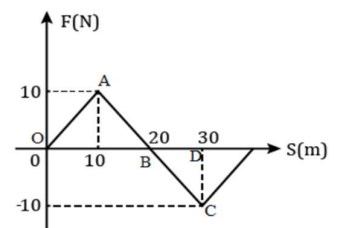
2. Adjacent figure shows the force-displacement graph of a moving body, the work done in displacing body from x=0 to x=35m is equal to,