

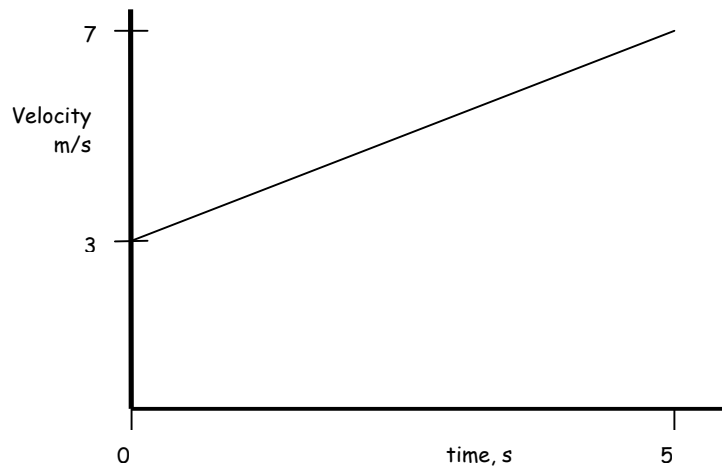
Transport, Speed and Energy

(1)

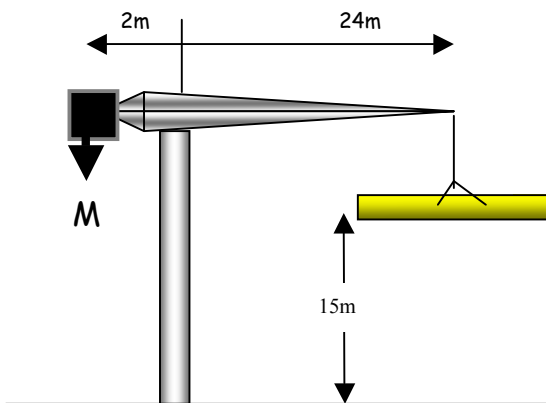
Show all working

- A car travels 300m in 20s. Calculate its speed.
- It then increases its speed to 27m/s, taking 8s to do so. Calculate the acceleration.
- Heading home the car travels 1.8km in 2 minutes. What is its av. speed (m/s).

- Calculate the distance travelled in the portion of the journey shown by the graph.



(2)



A crane lifts a pipe weighing 30kN.

Calculate :

- The work done on the crane arm by the pipe.
- The mass, M , of the counter-balance if the crane is balanced.
- The potential energy the pipe has.
- The cable brakes. What velocity will the pipe hit the ground at?

(3)

On lift-off the shuttle produces 33MN of thrust.
The launch mass of the shuttle is 2Mkg.

- Calculate the weight of the shuttle before launch.
- What is its initial acceleration (m/s^2)?

