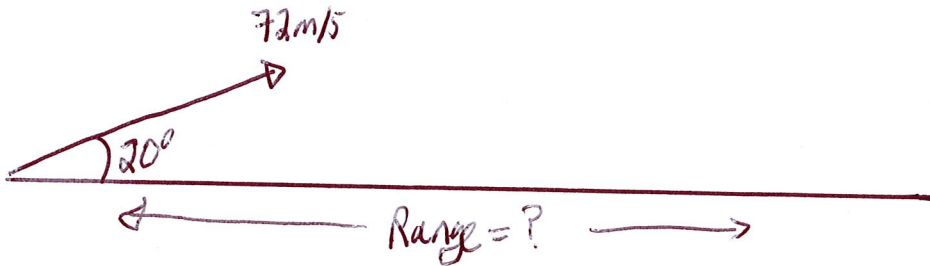


Unit 1 Kinematics

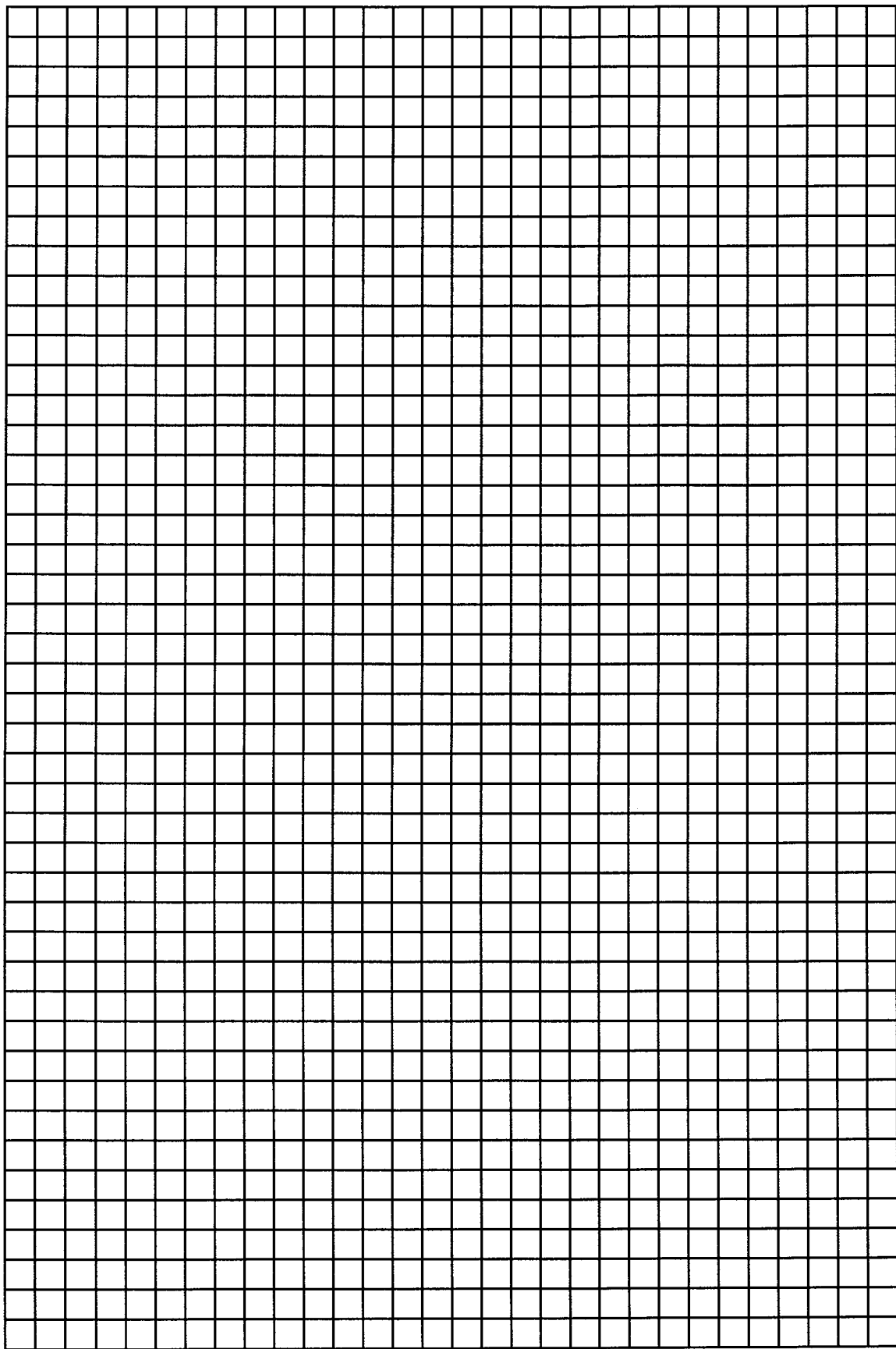
1. Find the hang time and range for the arrow fired at a 20 degree angle above the horizontal with a velocity of 72 m/s.



2. Construct a velocity vs time graph that represents a car accelerating at 2 m/s^2 starting from rest for 8 seconds and then continuing with a constant velocity for another 4 seconds.

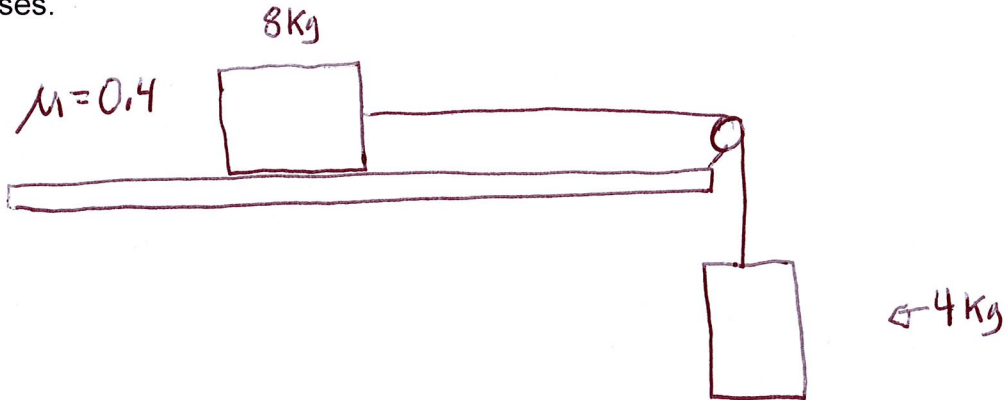
Show how far the car travels from 0 to 8 seconds.

Show your working on the graph.



Unit 2 Forces

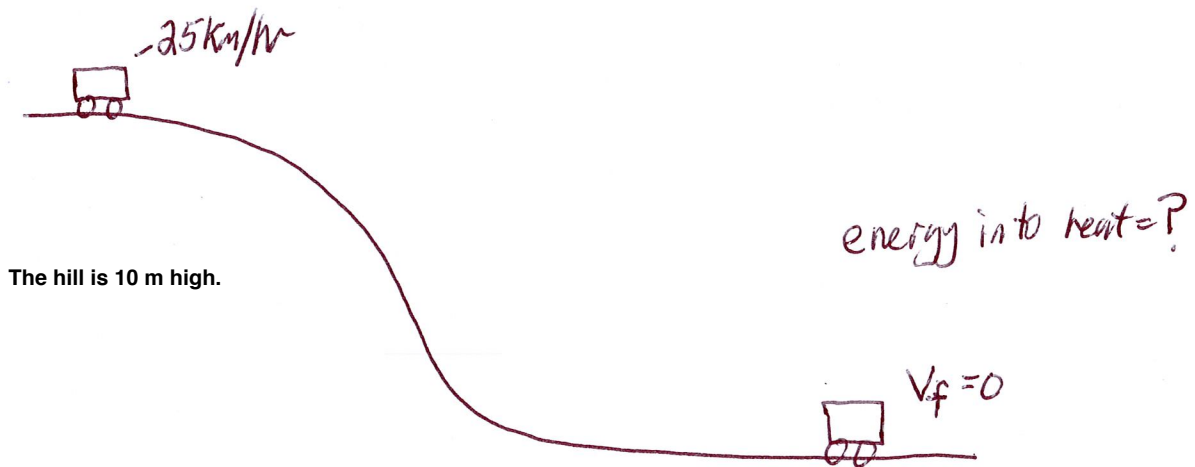
Find the acceleration of the system and the tension in the cord joining the two masses.



Unit 3 Energy

A 2200 kg car has a velocity of 25 km/hr at the top of the hill.

How much energy must be dissipated by the breaks for the car to come to a complete stop



Unit 4 Momentum

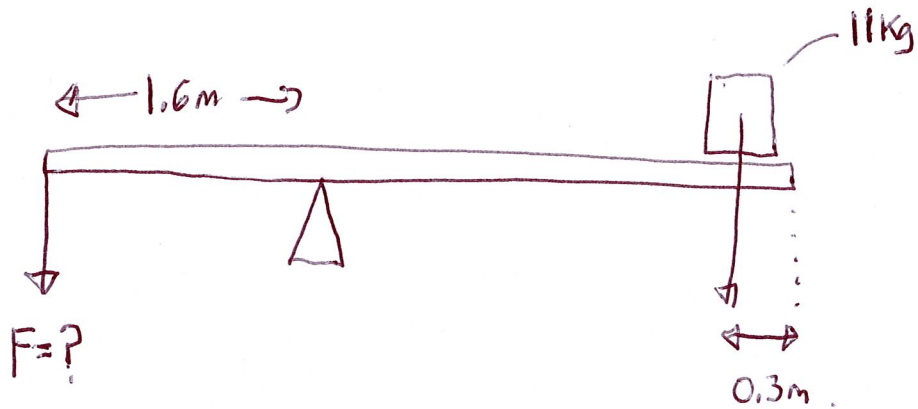
A 1900 kg car travelling west at 100 km/hr crashes head on into a 16,000kg semi going east at 60km/hr. What is the velocity of the wreck?

A 2600 kg truck travelling north at 90 km/hr collides with a 1800 kg car travelling east at 30 km/hr. Find the velocity (direction and speed) of the wreck.

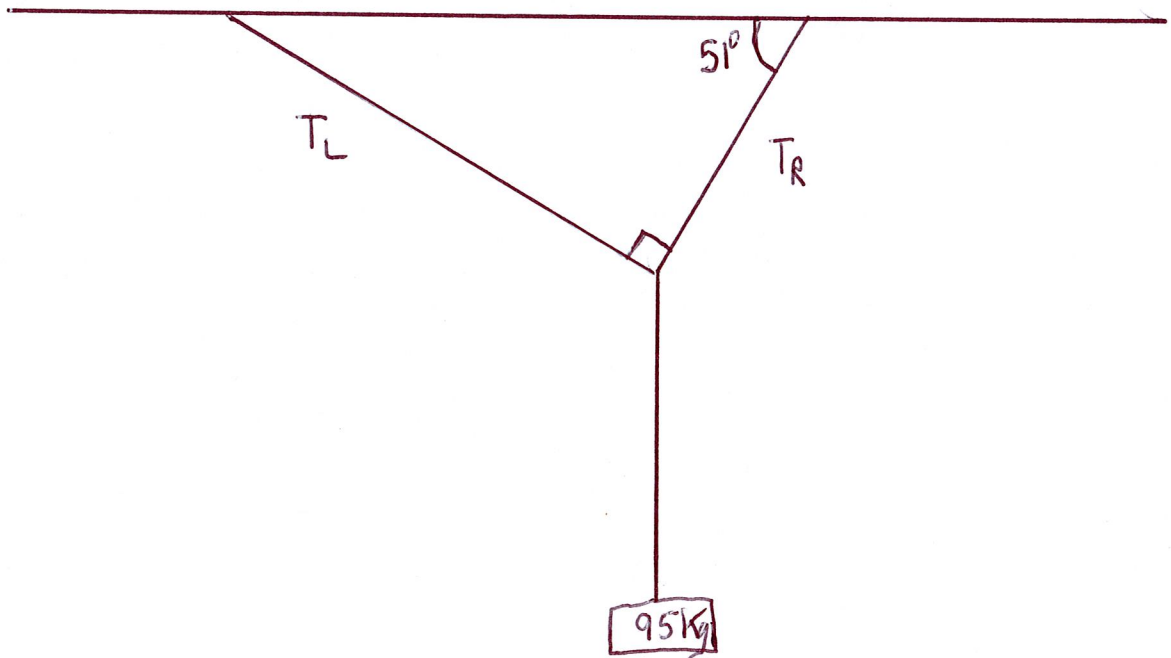
Unit 5 Static Equilibrium

uniform 4m beam, 10kg

Find the force required to balance the beam.



Find the tension in the cables supporting the hanging mass



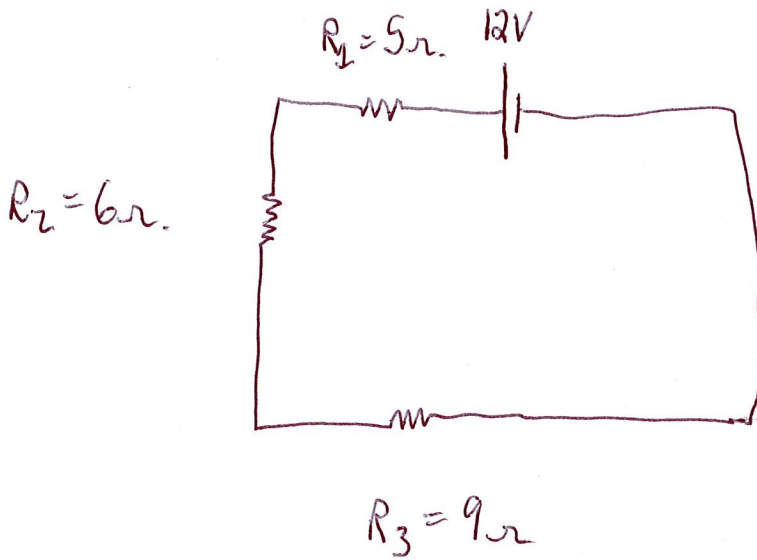
Unit 6

A jet plane is travelling at 280 km/hr and while in combat pulls a loop with a radius of 74 m. The pilot has a mass of 72 kg.

Find the force on the pilot from the seat at the top and bottom and top of a loop.

Unit 8/Electricity

Find the missing values in the circuits below.

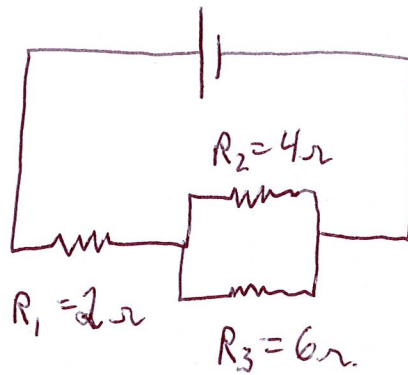


$$I_1 = \underline{\quad} \quad V_1 = \underline{\quad}$$

$$I_2 = \underline{\quad} \quad V_2 = \underline{\quad}$$

$$I_3 = \underline{\quad} \quad V_3 = \underline{\quad}$$

Find the missing values in the circuits below.



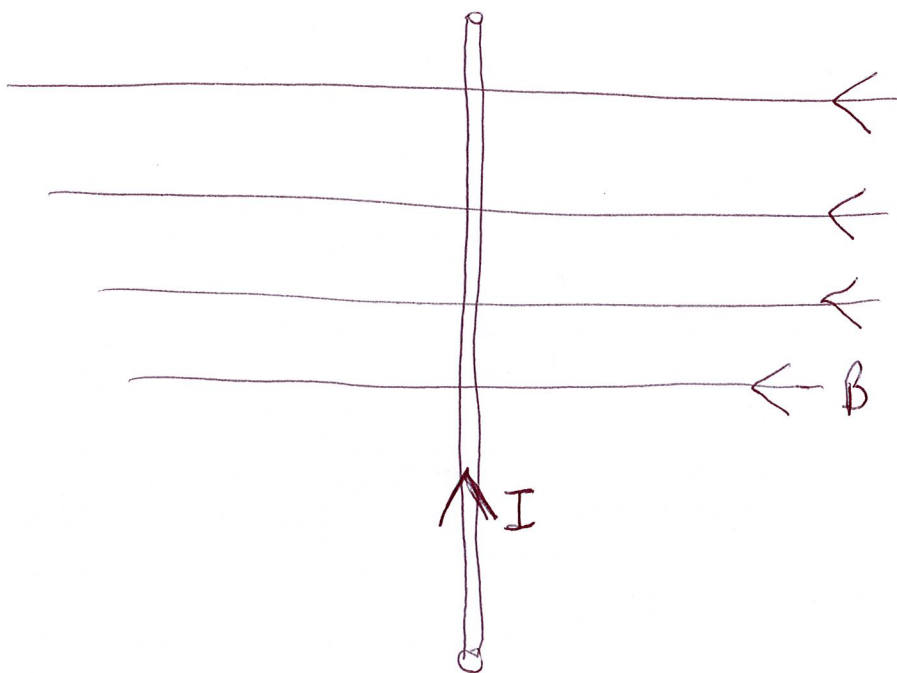
$$I_1 = \text{---} \quad V_1 = \text{---}$$

$$I_2 = \text{---} \quad V_2 = \text{---}$$

$$I_3 = \text{---} \quad V_3 = \text{---}$$

Unit 9 – Electromagnetism

Find the direction of the force in the example below.



Find the direction of the current in the direction below

