

GROUP WORKSHEET 1

Problem 1

A 160.0 kg sled is acted on by an unbalanced force of 20.0 N. How long will it take the sled to acquire a velocity of 3.0 m/s?

Problem 2

Determine the magnitude and direction of the force that Fred, whose mass is 90.0 kg, exerts on the floor of a lift when it is:

- at rest
- rising with constant velocity of 4.00 m/s
- descending with constant velocity of 4.00 m/s
- rising with constant acceleration of 2.00 m/s²
- descending with constant acceleration of 2.00 m/s²

Answer: (a) 880 N (b) 880 N (c) 880 N (d) 1 060 N (e) 700 N

Problem 3

Blocks A ($m_A = 2.00$ kg) and B ($m_B = 4.00$ kg) rest on a smooth plane and are pushed by a 200.0 N force.

Determine:

- the acceleration of the system;
- the force exerted by **A** on **B** (magnitude and direction)
- the force exerted by **B** on **A** (magnitude and direction).

Problem 4

- Compute the kinetic energy, **E**, of a 925 kg automobile travelling at 54 km/h.
- What would be the kinetic energy if the velocity were doubled?