Test - Forces and Newton's laws

Year: Year 12 · Duration: 60 minutes · /20

Name:	Date:	**Mark: /20**

Question	1	2	3	4	5	Total
marks	4	4	4	4	4	**20**
Mark						

Show your working.

Question 1 (4 marks)

Question 1 – Resultant

Two forces of 9 N and 12 N act at right angles on a particle. Find the magnitude of the resultant and the angle it makes with the 12 N force.

Question 2 (4 marks)

Question 2 – Newton's second law

A 5 kg block is pulled across a rough horizontal table by a horizontal force of 30 N. The resistance to motion is 12 N.

a. Find the acceleration. (2 marks)
b. Find the distance travelled in 4 s from rest. (2 marks)

Question 3 (4 marks)

Question 3 – Connected particles

Particles of mass 2 kg and 4 kg are connected by a light string over a smooth pulley and released from rest. Find the acceleration and the tension.

Question 4 (4 marks)

Question 4 – Inclined plane

A block of mass 3 kg slides down a smooth slope inclined at 40° to the horizontal. Find the normal reaction and the acceleration.

Question 5 (4 marks)

Question 5 – Problem: a lorry and trailer

A lorry of mass 3 000 kg tows a trailer of mass 1 000 kg. The driving force is 8 000 N.

The resistances are 1 500 N on the lorry and 500 N on the trailer.

a. Find the acceleration. (2 marks)
b. Find the tension in the tow-bar. (2 marks)