

Forces

Name & Set

Fill in the blank spaces in the table below. In each case show all working in your exercise book.

	Force / N	Mass / kg	Acceleration / m/s ²	
a		1	1	[1]
b		3	0.5	[1]
c		10	3	[1]
d		0.4	1	[1]
e		5	0.2	[1]
f	10	1		[1]
g	3	6		[1]
h	20	4		[1]
j	100	0.02		[1]
k	2	0.3		[1]
l	3		9	[1]
m	40		10	[1]
n	4500		0.3	[1]
o	0.1		0.02	[1]
p	0.03		6	[1]

1 A mass of 8 kg accelerates at a 5 m/s². What force is acting upon it?

[2]

2 (a) What is the acceleration of a mass of 24 kg when a force of 6 N acts upon it?

[2]

(b) What would be the acceleration of the same object if a force of 30 N acts upon it?

[2]

3 A force of 4 N acts on an object of mass 0.5 kg that is initially at rest

(a) Calculate the acceleration of the object.

[2]

(b) What velocity will this object reach if the force acts on it for 10 seconds?

[3]

4 A small trolley of mass 2.5kg is accelerated from rest by a force of 20 N. The force acts continuously for 4 seconds.

(a) Calculate the acceleration of the trolley.

[2]

(b) What velocity will the trolley reach after 4 seconds?

[3]

5 Here is the manufacturer's data about a family car:

Mass of car = 800 kg

Car can accelerate from 0 to 30 m/s in 12 seconds

(i) Calculate the car's acceleration based on the manufacture's specification

[3]

(ii) Calculate the force needed to produce this acceleration

[2]

The manufacturer claims that this car has a top speed of 144 km/hr (40 m/s).

(iii) How long would it take the car to reach this speed if it maintained its maximum acceleration.

[3]

(iv) Explain why the car can't exceed this speed.

[4]