KS3 Forces Practice Exam Questions

1. There are two types of forces: contact and non-contact.

   a. Place **one** tick in each row to show whether the named force is a contact force or a non-contact force.

[7]

Force	Contact	Non-Contact
friction		
air resistance		
gravitational		
upthrust		
magnetic		
reaction		
electrostatic		

   b. Describe how non-contact forces act. [3]

_____

_____

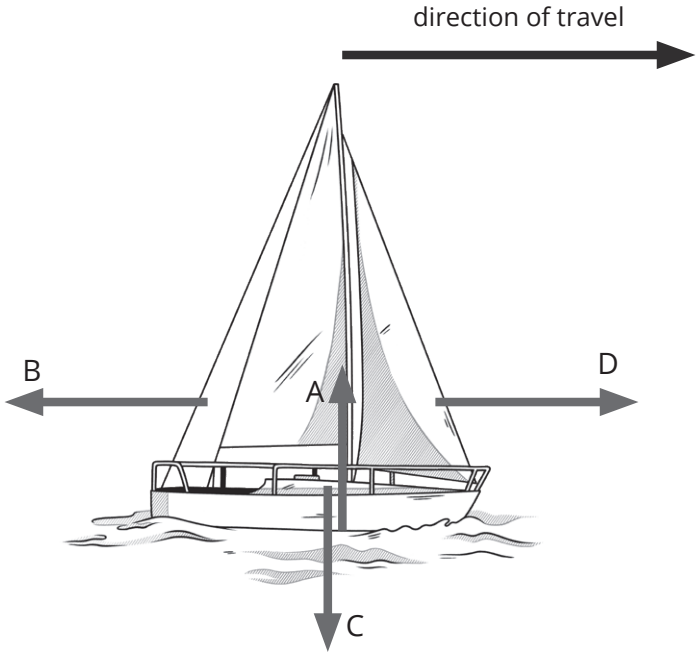
_____

_____

   c. List three things that forces can do to an object. [3]

1. _____
2. _____
3. _____

2. The diagram shows a sailing boat pulling out of a harbour.



a. Give the letter of the arrow that represents upthrust. [1]

_____

b. Which force is represented by arrow B? [1]

_____

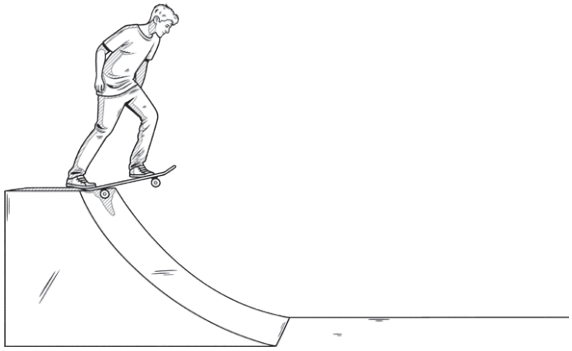
c. When the boat is travelling at a constant speed in the direction shown, which two forces must be balanced?
Give two letters. [2]

_____ and _____

d. As the boat passes out of the harbour, it accelerates (speeds up). One force is now larger than the other forces.
Give the letter of the force that is now the largest. [1]

_____

3. A skateboarder is investigating the effect that different surfaces have on the motion of a skateboard. They move a ramp onto different surfaces and measure the distance that the skateboard travels from the bottom of the ramp.



The table shows their results.

Surface	**Distance Travelled (m)**			
	Repeat 1	**Repeat**	**Repeat 3**	**Mean**
concrete path	8.1	8.5	8.0	8.2
paving slabs	7.5	7.4	7.6	
wooden decking	6.7	7.3	7.0	7.0
grass	1.0	1.2	0.9	1.0
artificial grass	3.1	3.2	3.0	3.1
sand	0.5	0.4	0.4	0.4

a. Name the independent variable in this investigation. [1]

_____

b. Complete the table by calculating the mean distance the skateboarded travelled on paving slabs.

[1]

_____

_____

c. Name a resistive force that acts on the skateboard. [1]

_____

d. State two things that will happen to the skateboard as a result of the forces acting on it.

1. _____

2. _____ [2]

e. Explain why the distance travelled on artificial grass is shorter than the distance travelled on concrete.

[4]

_____

_____

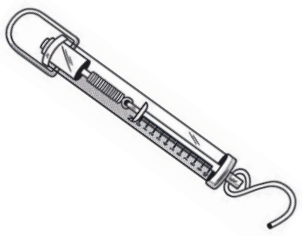
_____

_____

_____

_____

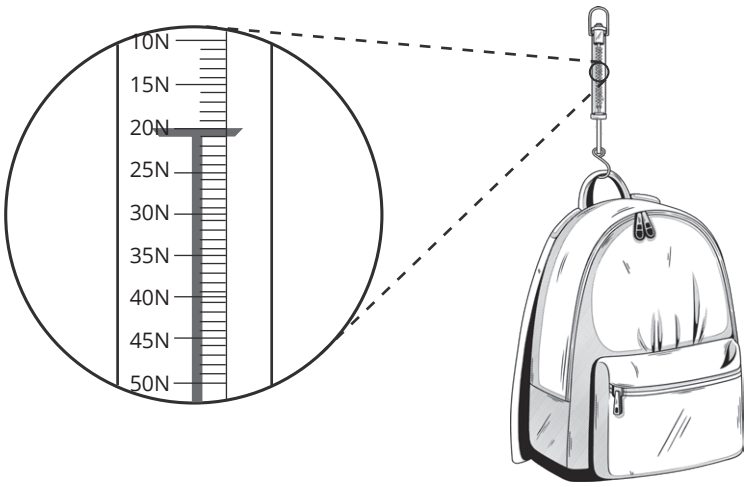
4. A student measures the weight of their school bag using the equipment shown below.



a. Name this piece of equipment. [1]

_____

b. Look at the diagram below.
What is the weight of the bag? Give the unit of measurement. [2]



Weight = _____ Unit _____

c. Write down the equation that links gravitational field strength, mass and weight. [1]

_____

d. If the gravitational field strength on Earth is 10N/kg, calculate the mass of the bag. Give the unit of measurement. [3]

_____

_____

_____

Mass = _____ Unit _____

e. The gravitational field strength on the Moon is 1.6N/kg. Explain what would happen to the mass and weight of a bag if it was taken to the Moon. [4]

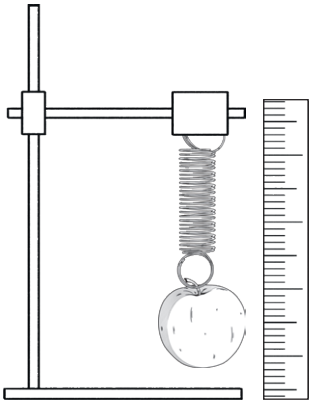
Mass would _____

_____

Weight would _____

_____

5. A student uses a spring to work out the weight of an apple. He sets up his equipment as shown below.



a. Write out the equation that links extension, force and spring constant. [1]

_____

b. The spring constant of the spring is 27N/m. The extension of the spring is 7cm.

Calculate the weight of the apple. Give the unit of measurement. [3]

_____

_____

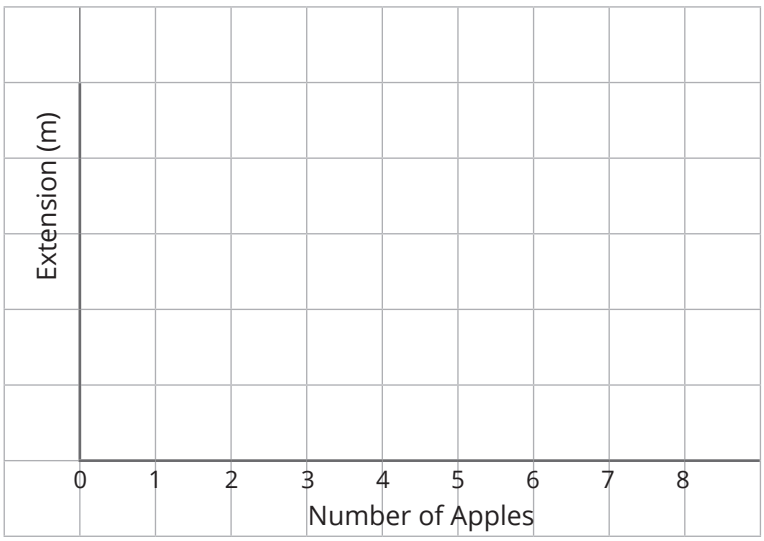
Weight = _____ Unit _____

c. The student continues to add apples to the spring. It reaches its elastic limit once five apples have been added.
What is meant by the term 'elastic limit'? [1]

_____

_____

d. On the grid below, sketch the shape of the graph produced by the student's investigation.



[3]

KS3 Forces Practice Exam Questions **Answers**

1. There are two types of forces: contact and non-contact.

   a. Place **one** tick in each row to show whether the named force is a contact force or a non-contact force.

[7]

Force	**Contact**	**Non-Contact**
friction	✓	
air resistance	✓	
gravitational		✓
upthrust	✓	
magnetic		✓
reaction	✓	
electrostatic		✓

   b. Describe how non-contact forces act. [3]

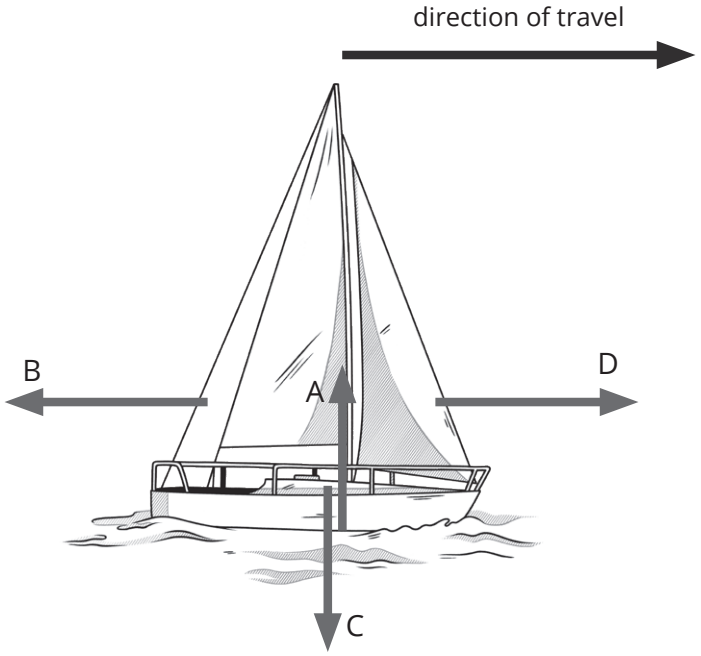
   Award one mark for each of the following:

   Non-contact forces act between objects that are not physically touching.
   They act in fields.
   A special area where an object can experience a force.

   c. List three things that forces can do to an object. [3]

      1. **change speed (allow speed up or slow down)**
      2. **change direction**
      3. **change shape**

2. The diagram shows a sailing boat pulling out of a harbour.



a. Give the letter of the arrow that represents upthrust. [1]

A

b. Which force is represented by arrow B? [1]

air resistance

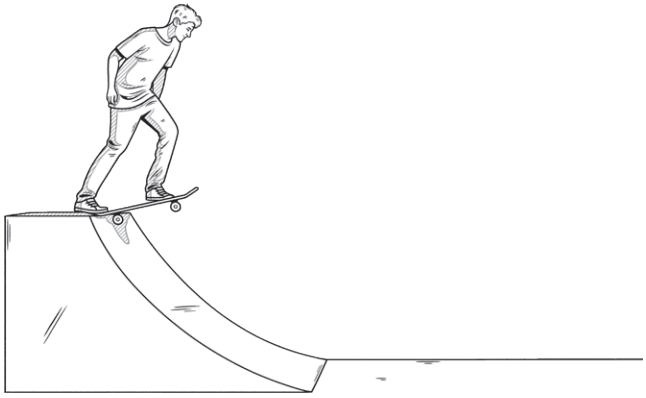
c. When the boat is travelling at a constant speed in the direction shown, which two forces must be balanced?
Give two letters. [2]

B and **D**

d. As the boat passes out of the harbour, it accelerates (speeds up). One force is now larger than the other forces.
Give the letter of the force that is now the largest. [1]

D

3. A skateboarder is investigating the effect that different surfaces have on the motion of a skateboard. They move a ramp onto different surfaces and measure the distance that the skateboard travels from the bottom of the ramp.



The table shows their results.

Surface	**Distance Travelled (m)**			
	Repeat 1	**Repeat**	**Repeat 3**	**Mean**
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wooden decking	6.7	7.3	7.0	7.0
grass	1.0	1.2	0.9	1.0
artificial grass	3.1	3.2	3.0	3.1
sand	0.5	0.4	0.4	0.4

a. Name the independent variable in this investigation. [1]

type of surface

b. Complete the table by calculating the mean distance the skateboarded travelled on paving slabs.

[1]

7.5 + 7.4 + 7.6 = 22.5
22.5 ÷ 3 = 7.5
Accept correct answer if written in the table.

c. Name a resistive force that acts on the skateboard. [1]

Any one from:

friction
air resistance

d. State two things that will happen to the skateboard as a result of the forces acting on it.

1. **The skateboard will slow down.**
2. **The wheels will heat up.** [2]

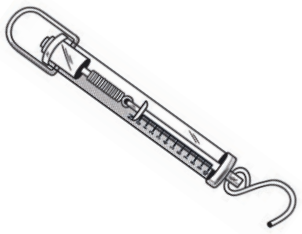
e. Explain why the distance travelled on artificial grass is shorter than the distance travelled on concrete.

[4]

Award one mark for each of the following:

There is more friction on the artificial grass.
Artificial grass is rougher than concrete.
Artificial grass will grip the wheels of the skateboard more.
The skateboard will slow down more quickly.

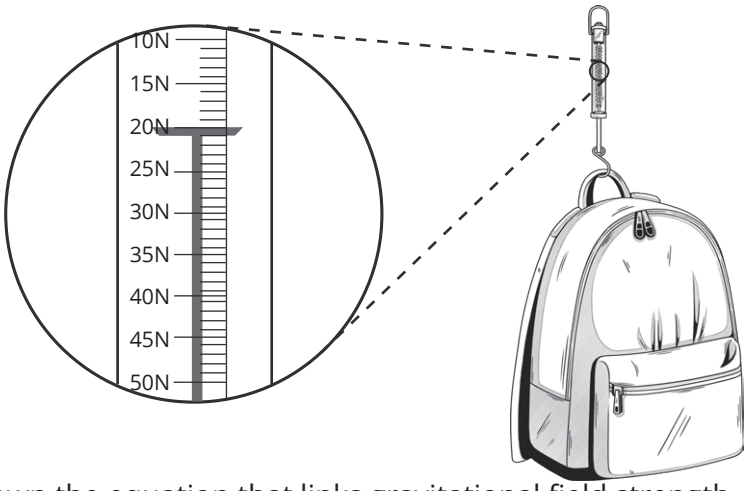
4. A student measures the weight of their school bag using the equipment shown below.



a. Name this piece of equipment. [1]

newton meter

b. Look at the diagram below.
What is the weight of the bag? Give the unit of measurement. [2]



Weight = **20N**

c. Write down the equation that links gravitational field strength, mass and weight. [1]

weight = mass × gravitational field strength

d. If the gravitational field strength on Earth is 10N/kg, calculate the mass of the bag. Give the unit of measurement.

mass = weight ÷ gravitational field strength (1) [3]
20N ÷ 10N/kg = 2kg

Mass = **2 (1)** Unit **kg (1)**

An answer of 2kg with no working scores 3 marks.
Allow error carried forward from part b. for the value of weight.

e. The gravitational field strength on the Moon is 1.6N/kg. Explain what would happen to the mass and weight of a bag if it was taken to the Moon.

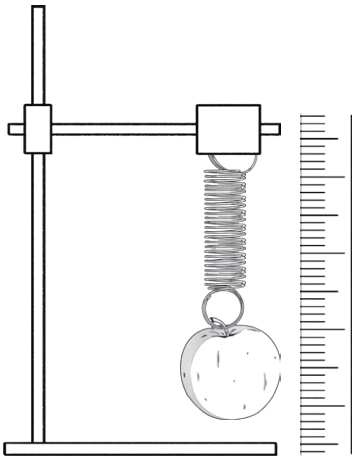
Mass would **stay the same (1)**

because it is not affected by the gravitational field strength. (1)

Weight would **decrease (1)**

because the gravitational field strength on the Moon is lower than the gravitational field strength on Earth. (1) [4]

5. A student uses a spring to work out the weight of an apple. He sets up his equipment as shown below.



a. Write out the equation that links extension, force and spring constant. [1]

force = spring constant × extension

b. The spring constant of the spring is 27N/m. The extension of the spring is 7cm.

Calculate the weight of the apple. Give the unit of measurement. [3]

7cm = 0.07m (1)
27N/m × 0.07m = 1.89N

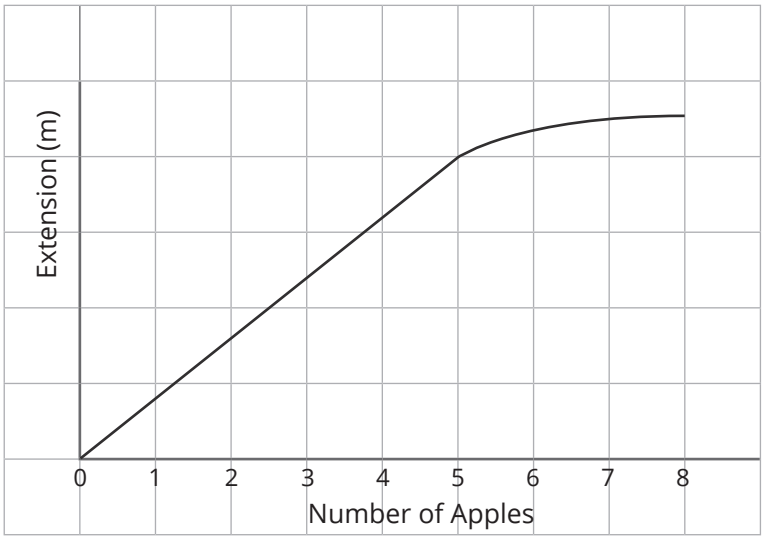
Weight = **1.89 (1)** Unit **N (1)**

An answer of 1.89N with no working scores 3 marks.

c. The student continues to add apples to the spring. It reaches its elastic limit once five apples have been added.
What is meant by the term 'elastic limit'? [1]

The spring will no longer go back to its original shape.

d. On the grid below, sketch the shape of the graph produced by the student's investigation.



[3]

Award one mark for each of the following:

A line that starts at the origin.
A straight line between 0 and 5 apples.
The line curves after 5 apples.