Weight and work done

Physics Paper 2 calculations | AQA Combined Science 8464 and AQA GCSE Physics 8463 | 15 questions, 42 marks

GCSE science calculations

Scan for the solutions

Equations for this topic (cover this box to practise recalling them)

- weight = mass × gravitational field strength learn this one
- work done = force × distance learn this one
- power = $\frac{\text{work done}}{\text{time}}$ learn this one

Name: _____ **Date:** _____ **Score:** _____ **/ 42**

1 Tomasz has a mass of 65 kg.

Gravitational field strength on Earth = 9.8 N/kg

Calculate the weight of Tomasz.

(2 marks)

Answer _____

2 Grace pushes a supermarket trolley with a constant force of 40 N. The trolley moves 15 m in the direction of the force.

Calculate the work done by Grace.

(2 marks)

Answer _____

3 An astronaut and her spacesuit have a total mass of 120 kg.

Gravitational field strength on the Moon = 1.6 N/kg

Calculate the weight of the astronaut and spacesuit on the Moon.

(2 marks)

Answer _____

4 An apple has a mass of 150 g.

Gravitational field strength on Earth = 9.8 N/kg

Calculate the weight of the apple.

(2 marks)

Answer _____

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5 Niamh closes a drawer by pushing it with a force of 12 N. The drawer moves 45 cm.

Calculate the work done by Niamh.

(2 marks)

Answer _____

6 A tractor pulls a trailer along a farm track with a constant force of 2.5 kN. The trailer moves 0.40 km.

Calculate the work done by the tractor in joules.

Give your answer in standard form.

(3 marks)

Answer _____

7 A suitcase has a weight of 196 N.

Gravitational field strength on Earth = 9.8 N/kg

Calculate the mass of the suitcase.

(2 marks)

Answer _____

8 A rock sample on Mars has a mass of 3.0 kg. A rover measures its weight on Mars as 11.1 N.

Calculate the gravitational field strength on Mars.

(2 marks)

Answer _____

9 Ibrahim pulls a sledge 8.0 m across snow. He does 1.2 kJ of work on the sledge.

Calculate the force Ibrahim uses to pull the sledge.

Assume the force acts along the direction the sledge moves.

(3 marks)

Answer _____

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10 Mei lifts a box of books with a mass of 12 kg onto a shelf 1.5 m above the floor.

Gravitational field strength on Earth = 9.8 N/kg

Calculate the work done lifting the box.

Give your answer to 2 significant figures. Show your working.

(4 marks)

Answer _____

11 Ravi and Leah push a sofa across a floor at a steady speed. The friction force on the sofa is 180 N. They push the sofa 3.5 m in 14 s.

a. Calculate the work done against friction.

b. Calculate the power they develop. Show your working.

(4 marks)

Answer _____

12 A lift in a block of flats in Leeds carries passengers up 18 m at a steady speed. The total mass of the lift car and the passengers is 850 kg.

Gravitational field strength on Earth = 9.8 N/kg

Calculate the work done against gravity raising the lift car and passengers.

Give your answer in standard form to 2 significant figures. Show your working.

(4 marks)

Answer _____

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13 A space rover has a weight of 1764 N on Earth. It is sent to Mars.

Gravitational field strength on Earth = 9.8 N/kg

Gravitational field strength on Mars = 3.7 N/kg

a. Calculate the mass of the rover.

b. Calculate the weight of the rover on Mars. Show your working.

(4 marks)

Answer _____

14 Elif pushes a 25 kg wheelbarrow 12 m along a flat garden path. She pushes with a constant force of 80 N in the direction it moves.

Calculate the work done by Elif.

(2 marks)

Answer _____

15 Kwabena pushes a 40 kg box up a ramp into a van. The ramp is 3.0 m long. The floor of the van is 0.80 m above the ground.

Gravitational field strength = 9.8 N/kg

Calculate the work done against gravity in raising the box onto the van floor. Show your working.

(4 marks)

Answer _____

End of questions | Total 42 marks

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