Forces and Motion

GCSE Science • **Combined and Triple** • Grades 3–6

Name: _____ Class: _____ Total: _____ / 53

Show all your working. Marks are given for correct method as well as the final answer.

1. Explain the difference between a scalar and a vector quantity. **[2 marks]**

Answer: _____

2. Give one example each of a contact and a non-contact force. **[2 marks]**

Answer: _____

3. Write down the equation for weight. **[1 mark]**

Answer: _____

4. Work out the weight of a 60 kg person. Take $g = 9.8$ N/kg. **[2 marks]**

Answer: _____ **N**

5. Explain why an object's mass is the same on the Moon but its weight is not. **[3 marks]**

Answer: _____

6. A car has 4 000 N driving force and 1 500 N drag. Work out the resultant force. **[2 marks]**

Answer: _____ **N**

7. Describe what happens to an object when the resultant force on it is zero. **[2 marks]**

Answer: _____

8. State Newton's second law as an equation. **[1 mark]**

Answer: _____

9. A 1 200 kg car has a resultant force of 3 600 N. Work out its acceleration. **[3 marks]**

Answer: _____ **m/s^2**

10. A force of 250 N gives an acceleration of 5 m/s^2. Work out the mass. **[3 marks]**

Answer: _____ **kg**

11. State Newton's third law. **[2 marks]**

Answer: _____

12. Write down the equation for acceleration. **[1 mark]**

Answer: _____

13. A car speeds up from 5 m/s to 25 m/s in 8 s. Work out its acceleration. **[3 marks]**

Answer: _____ **m/s^2**

14. Describe what the gradient of a distance-time graph represents. **[1 mark]**

Answer: _____

15. Describe what the AREA under a velocity-time graph represents. **[1 mark]**

Answer: _____

16. Explain what terminal velocity is. **[3 marks]**

Answer: _____

17. Write down the two parts that make up stopping distance. **[2 marks]**

Answer: _____

18. Give two factors that increase thinking distance. **[2 marks]**

Answer: _____

19. A car travels at 20 m/s and the driver's reaction time is 0.7 s.

(a) Work out the thinking distance. **[3 marks]**

(b) Give two factors that would increase the BRAKING distance. **[2 marks]**

Answer: _____

20. A 0.5 kg ball is kicked and reaches 12 m/s.

(a) Write down the equation for momentum and work out the ball's momentum. **[3 marks]**

(b) The ball is stopped in 0.2 s. Work out the force on it. **[3 marks]**

Answer: _____

21. A skydiver falls from a plane.

(a) Explain why she accelerates at first. **[3 marks]**

(b) Explain what happens to her speed when the parachute opens. **[3 marks]**

Answer: _____

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