

AS Edexcel

Unit 1

Physics

1st Quiz

Time: 50 minutes

Class:

Name:

SECTION A

Answer ALL questions.

For questions 1–10, in Section A, select one answer from A to D and put a cross in the box ☐. If you change your mind, put a line through the box ☒ and then mark your new answer with a cross ☐.

1 Acceleration can be found from the

- ☐ A area under a distance-time graph.
- ☐ B area under a velocity-time graph.
- ☐ C gradient of a distance-time graph.
- ☐ D gradient of a velocity-time graph.

(Total for Question 1 = 1 mark)

2 Which table is correct for scalar and vector quantities?

☐ A

	has magnitude	has a direction
scalar	✓	✓
vector	X	✓

☐ B

	has magnitude	has a direction
scalar	X	✓
vector	✓	✓

☐ C

	has magnitude	has a direction
scalar	✓	X
vector	✓	✓

☐ D

	has magnitude	has a direction
scalar	✓	✓
vector	✓	X

(Total for Question 2 = 1 mark)

3 An object has an acceleration of 6 m s^{-2} at an angle of 30° to the horizontal.

Which of the following expressions gives the horizontal component of acceleration in m s^{-2} ?

- ☐ A $6 \times \cos 30^\circ$
- ☐ B $6 \times \sin 30^\circ$
- ☐ C $\frac{6}{\cos 30^\circ}$
- ☐ D $\frac{6}{\sin 30^\circ}$

(Total for Question 3 = 1 mark)

Use the following information to answer Questions 4 and 5.

4 A body is acted on by a vertical force of 18 N and a horizontal force of 32 N.

The angle to the horizontal of the resultant force is given by

- ☐ A $\cos^{-1} (18/32)$
- ☐ B $\tan^{-1} (18/32)$
- ☐ C $\sin^{-1} (32/18)$
- ☐ D $\tan^{-1} (32/18)$

(Total for Question 4 = 1 mark)

5 The magnitude of the resultant force in N is

- ☐ A $32 + 18$
- ☐ B $32^2 + 18^2$
- ☐ C $\sqrt{32+18}$
- ☐ D $\sqrt{32^2 + 18^2}$

(Total for Question 5 = 1 mark)

6 Which of the following statements is true for the two forces in a Newton's third law pair?

- ☐ A They have different magnitudes and act in different directions.
- ☐ B They act in different directions on the same body.
- ☐ C They have the same magnitude and are different types of force.
- ☐ D They are the same type of force and act on different bodies.

(Total for Question 6 = 1 mark)

7 A ball is dropped from rest from a building 35.0 m high.

If air resistance is neglected the ball hits the ground with a speed of

- ☐ A 8.4 m s^{-1}
- ☐ B 13.1 m s^{-1}
- ☐ C 18.5 m s^{-1}
- ☐ D 26.2 m s^{-1}

(Total for Question 7 = 1 mark)

8 A ball is thrown vertically upwards with an initial velocity of 20 m s^{-1} . An equation of motion is used to calculate the time taken for the ball to move to a displacement of 15 m.

Which of the following expressions shows a correct substitution of appropriate values?

- ☐ A $15 = 20 \times t + \frac{1}{2} \times 9.81 \times t^2$
- ☐ B $15 = -20 \times t + \frac{1}{2} \times 9.81 \times t^2$
- ☐ C $15 = 20 \times t + \frac{1}{2} \times -9.81 \times t^2$
- ☐ D $15 = -20 \times t + \frac{1}{2} \times -9.81 \times t^2$

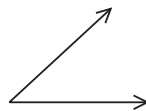
(Total for Question 8 = 1 mark)

9 Which of the following is a vector quantity?

- ☐ A distance
- ☐ B force
- ☐ C speed
- ☐ D work

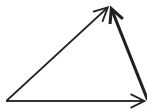
(Total for Question 9 = 1 mark)

10 The diagram represents two forces acting on an object.

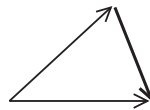


Which of the following shows a correct way to determine the resultant of these two forces?

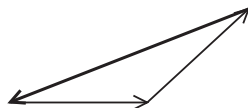
☐ A



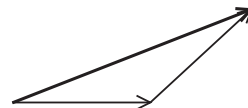
☐ B



☐ C



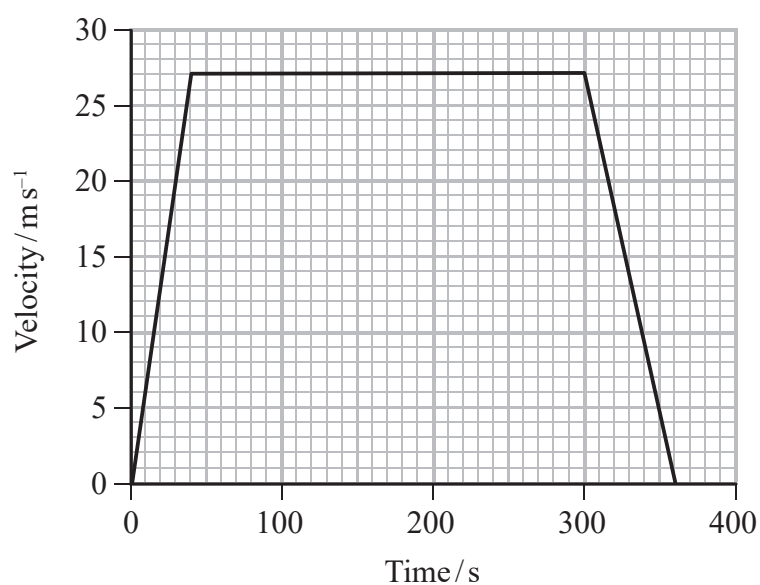
☐ D



(Total for Question 10 = 1 mark)

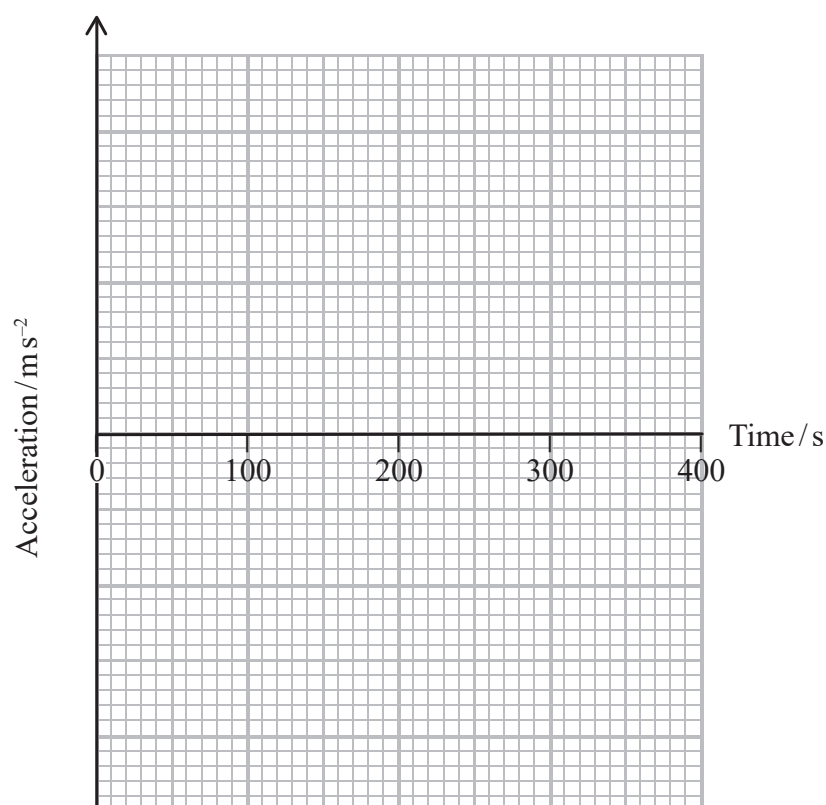
11 A train moves between two stations.

(a) A simplified velocity-time graph for the motion of the train is shown.



Draw a corresponding acceleration-time graph for the motion of the train. Show all working in the space below.

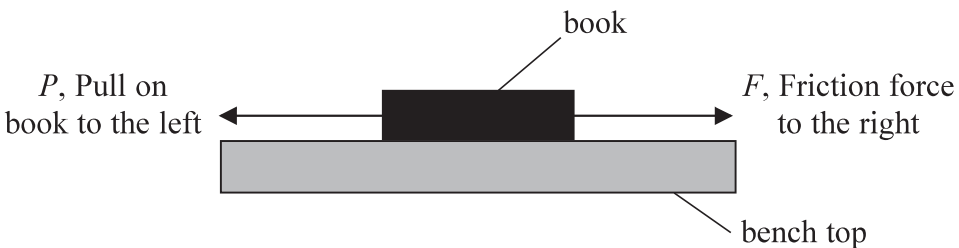
(6)



*12 Newton's third law is often poorly explained.

The following notes were written by a student.

Newton's third law



The diagram shows a black rectangular block labeled 'book' resting on a grey rectangular block labeled 'bench top'. A horizontal arrow labeled ' P , Pull on book to the left' points to the left from the center of the book. Another horizontal arrow labeled ' F , Friction force to the right' points to the right from the center of the book. The two arrows are of equal length and are positioned symmetrically about the center of the book.

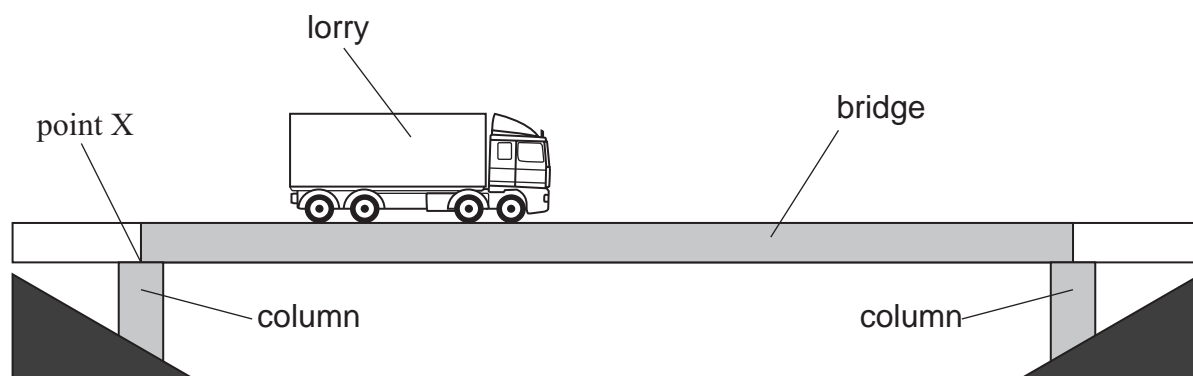
The book moves at a steady speed because F , the friction force to the right, is equal and opposite to P , the force pulling the book to the left.

Discuss why this is **not** an example of Newton's third law.

(6)

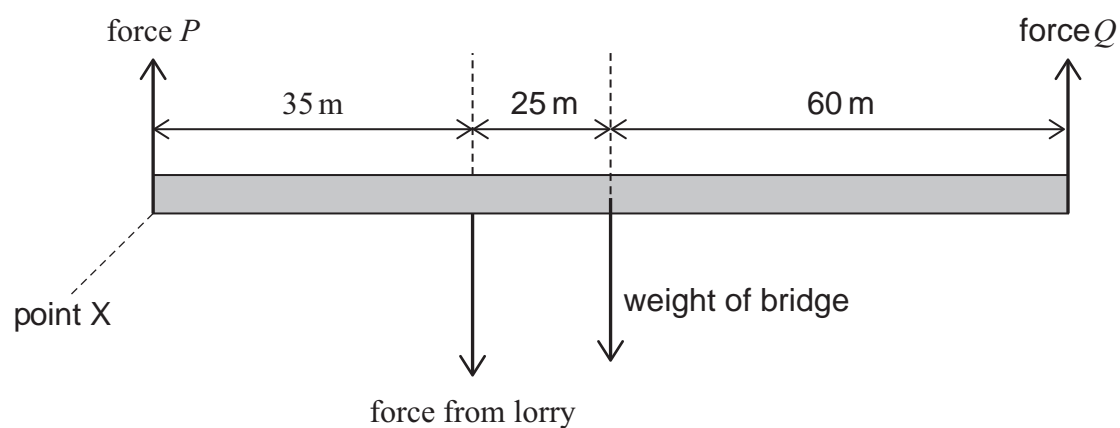
(Total for Question 12 = 6 marks)

13 A lorry is crossing a bridge. The bridge is supported by two columns, as shown.



Forces P and Q act on the bridge from the columns. The centre of gravity of the bridge is at its centre. At a particular time the lorry is 35 m from point X.

A simplified diagram showing the positions of the forces on the bridge is shown below.



(a) Calculate the magnitudes of the forces P and Q .

You should take moments about point X .

force from lorry = $4.2 \times 10^5 \text{ N}$

weight of bridge = $9.8 \times 10^5 \text{ N}$

(5)

$P =$

$Q =$

(b) Explain why force Q increases as the lorry moves across the bridge.

(5)

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DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

(Total for Question 18 = 10 marks)