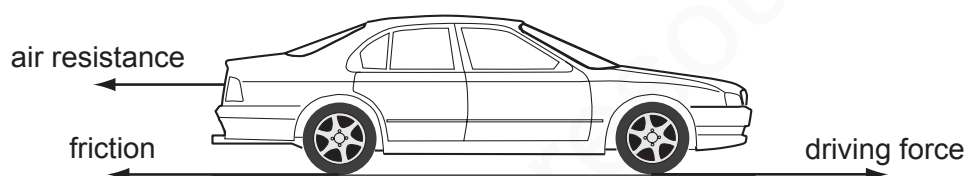


FORCES

1 In which of these situations is no resultant force needed?

- A a car changing direction
- ☒ B a car moving in a straight line at a steady speed
- C a car slowing down
- D a car speeding up

2 Three horizontal forces act on a car that is moving along a straight, level road.



Which combination of forces would result in the car moving at constant speed?

| | air resistance | friction | driving force |
|---------------------------------------|----------------|----------|---------------|
| A | 200 N | 1000 N | 800 N |
| B | 800 N | 1000 N | 200 N |
| <input checked="" type="checkbox"/> C | 800 N | 200 N | 1000 N |
| D | 1000 N | 200 N | 800 N |

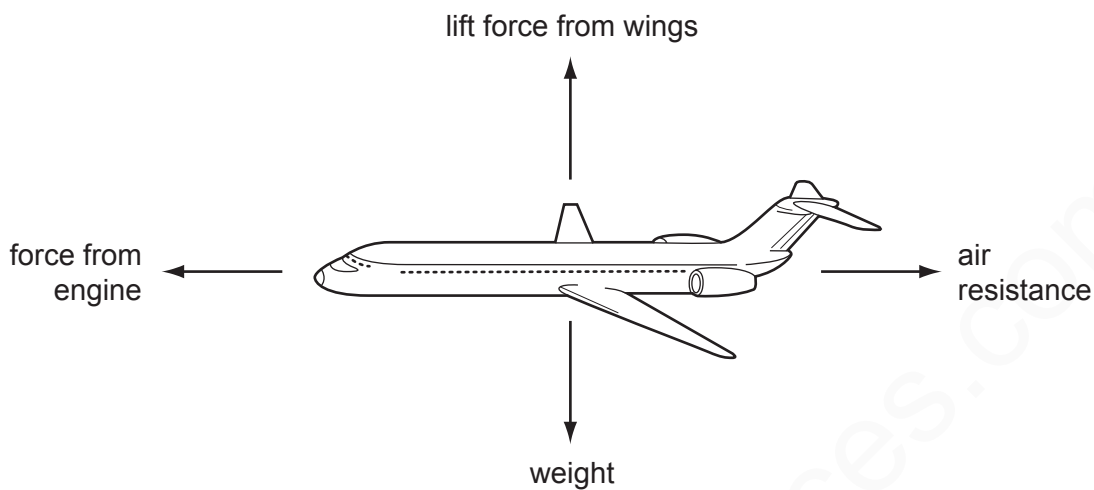
3 Two forces act on an object.

In which situation is it **impossible** for the object to be in equilibrium?

- ☒ A The two forces act in the same direction.
- B The two forces act through the same point.
- C The two forces are of the same type.
- D The two forces are the same size.

4 An aeroplane is in equilibrium.

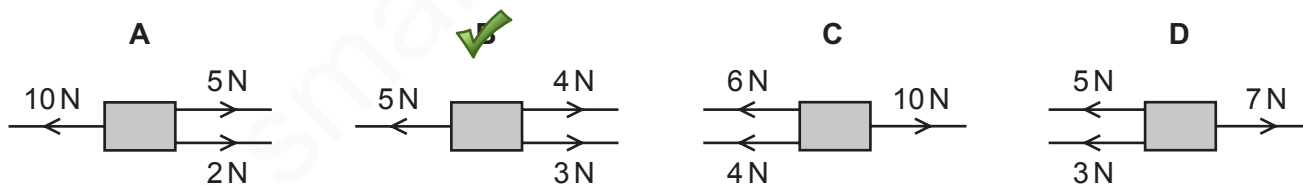
The diagram shows the forces acting on the aeroplane.



Which statement about the forces is correct?

| | force from engine | lift force from wings |
|-------------------------------------|-----------------------------|-----------------------|
| <input checked="" type="checkbox"/> | equal to air resistance | equal to weight |
| B | equal to air resistance | greater than weight |
| C | greater than air resistance | equal to weight |
| D | greater than air resistance | greater than weight |

5 Which combination of forces produces a resultant force acting towards the right?



6 A ball is thrown upwards.

What effect does the force of gravity have on the ball?

- ☒ A It produces a constant acceleration downwards.
 - ☐ B It produces a constant acceleration upwards.
 - ☐ C It produces a decreasing acceleration upwards.
 - ☐ D It produces an increasing acceleration downwards.
-

7 Which list contains the name of a force?

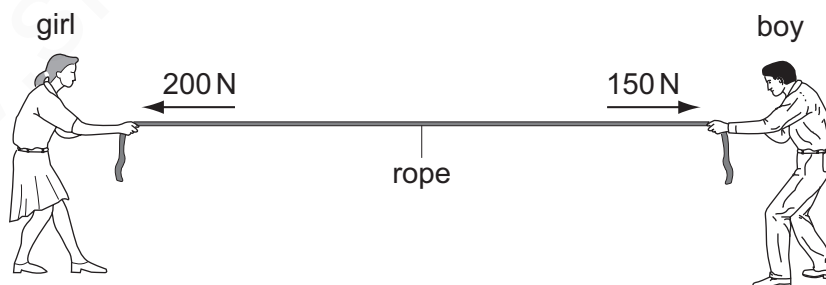
- ☐ A acceleration, charge, temperature
 - ☐ B density, resistance, speed
 - ☐ C distance, frequency, mass
 - ☒ D energy, power, weight
-

8 A force acts on a moving rubber ball.

Which of these changes could **not** happen to the ball because of the force?

- ☐ A a change in direction
 - ☒ B a change in mass
 - ☐ C a change in shape
 - ☐ D a change in speed
-

9 A girl and a boy are pulling in opposite directions on a rope. The forces acting on the rope are shown in the diagram.



Which single force has the same effect as the two forces shown?

- ☒ A 50 N acting towards the girl
- ☐ B 350 N acting towards the girl
- ☐ C 50 N acting towards the boy
- ☐ D 350 N acting towards the boy

10 In which situation is **no** resultant force needed?

- A a car changing direction at a steady speed
 - ✓ B a car moving in a straight line at a steady speed
 - C a car slowing down
 - D a car speeding up
-

11 A box is being moved by a fork-lift truck. The total weight of the box is 3000 N.



The force exerted by the fork-lift truck on the box is 3500 N upwards.

What is the resultant force on the box?

- A 500 N downwards
 - ✓ B 500 N upwards
 - C 6500 N downwards
 - D 6500 N upwards
-

12 Which statement about a moving object is correct?

- A When an object is accelerating, the resultant force acting on it must equal zero.
- B When an object is moving at a steady speed, the air resistance acting on it must equal zero.
- ✓ C When an object is moving at a steady speed, the resultant force acting on it must equal zero.
- D When an object is moving, there must be a resultant force acting on it.

13 On which ball is a non-zero resultant force acting?

A

a ball moving at constant speed on a smooth surface



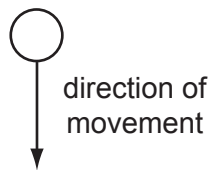
B

a ball at rest on a bench



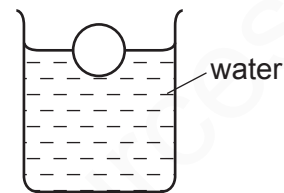
C

a free-falling ball which has just been released



D

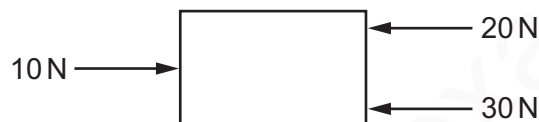
a ball floating on water



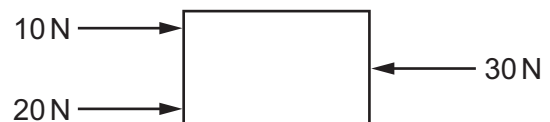
14 The diagrams show four identical objects. Each object is acted on by only the three forces shown.

Which object accelerates to the right, with the **smallest** acceleration?

A



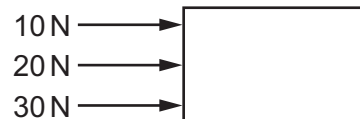
B



C



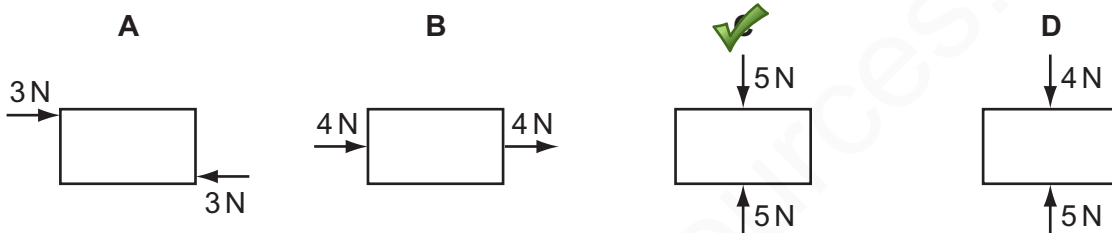
D



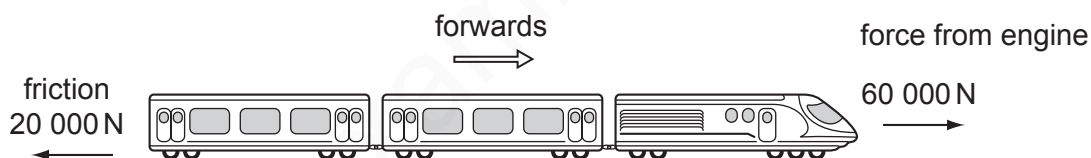
- 15** A student stands with both feet on some scales in order to measure his weight.
- The reading on the scales is 500 N. He lifts one foot off the scales and keeps it lifted.
- What is the new reading on the scales?

A 0 **B** 250 N **C** 500 N ☒ **D** 1000 N

-
- 16** The diagrams show different objects, each being acted upon by only the two forces shown.
- Which object is in equilibrium?



-
- 17** A train is travelling along a horizontal track at constant speed. Two of the forces acting on the train are shown in the diagram.

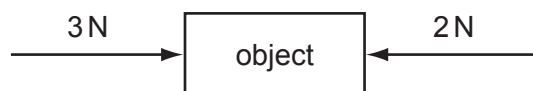


A force of air resistance is also acting on the train to give it a resultant force of zero.

What is this air resistance force?

- ☒ **A** 40 000 N backwards
- B** 80 000 N backwards
- C** 40 000 N forwards
- D** 80 000 N forwards

-
- 18** The object in the diagram is acted upon by the two forces shown.



What is the effect of these forces?

- A** The object moves to the left with constant speed.
- B** The object moves to the left with constant acceleration.
- C** The object moves to the right with constant speed.
- ☒ **D** The object moves to the right with constant acceleration.