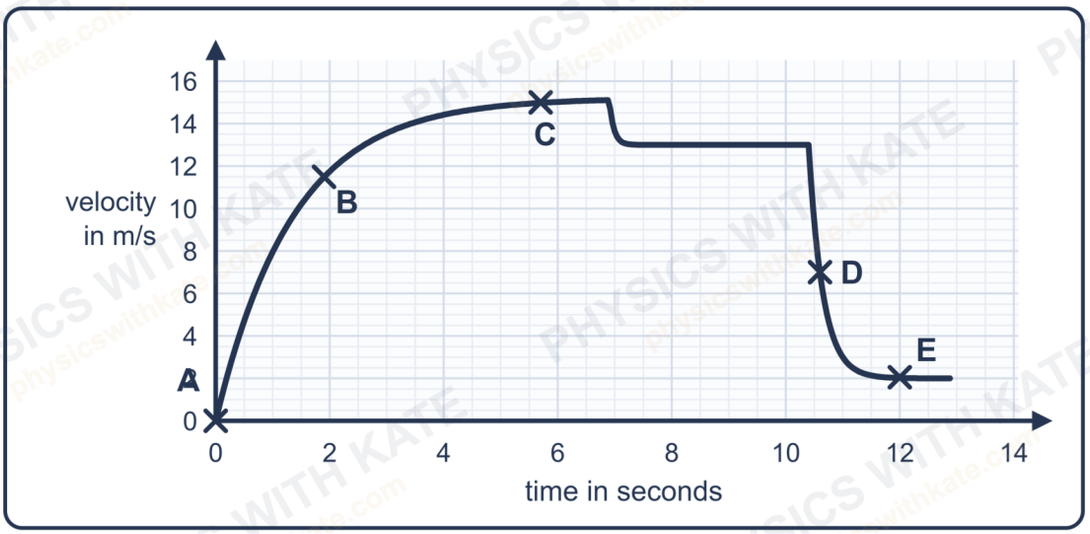
Terminal Velocity



$$F = m \times a$$

resultant force = mass × acceleration

For every stage you must say what the **resultant force** is doing and what the **acceleration** is doing.

1 **For each point, draw a force diagram showing the 2 forces on the parachutist.**

A | B | C | D | E

2 **For each stage: compare the forces, comment on the resultant force, comment on the acceleration.**

A WORKED EXAMPLE

Compare the forces: Weight only — air resistance is zero
Resultant force: Resultant force is downwards (large)
Acceleration: Acceleration is downwards, at its maximum

Air resistance increases with **speed**

B

Compare the forces: _____
Resultant force: _____
Acceleration: _____

_____ **increases with** _____

C

Compare the forces: _____
Resultant force: _____
Acceleration: _____

_____ **decreases with** _____

D

Compare the forces: _____
Resultant force: _____
Acceleration: _____

_____ **decreases with** _____

E

Compare the forces: _____
Resultant force: _____
Acceleration: _____

WORDS TO USE

air resistance | weight | greater than | less than | equal | speed | constant

Exam-Style Question [4 marks]

A skydiver jumps from a helicopter. She falls and reaches terminal velocity. She then opens her parachute, and soon reaches a new, lower terminal velocity.

Explain, in terms of the forces acting on her, why opening the parachute makes her reach a new, lower terminal velocity.