Lesson 14 - Revision 2

Physics - KS3

Forces and Motion

Mrs Wolstenholme

What is pressure?

Pressure is related to how spread out a _____ is over an _____.

Larger Area: _____ pressure

Larger Force: _____ pressure

Smaller Area: _____ pressure

Smaller Force: _____ pressure

Why do polar bears have such large feet?

The polar bears have large feet with a **large area**. This means the **pressure is low**. Which means they won't fall through the ice.

Why we hammer the sharp end of the nail into the wall?

The sharp end has a _____ **area**. This means the **pressure is** _____, which means it is easier to push into the wall.

Calculating Pressure or Force

Pressure	=	Force	÷	Area
(**Pa**) (**N/cm²**)		(N)		(**m²**) (**cm²**)

If the unit of area is given as cm^2 what is the unit of pressure?

Option 1

N/cm^2

Option 2

N/m^2

Option 3

Kilogram (kg)

Option 4

Pa

If the unit of area is given as m^2 what is the unit of pressure?

Option 1

N/cm^2

Option 2

N/m^2

Option 3

Kilogram (kg)

Option 4

Pa

Pressure = Force ÷ Area

	The surface area of an object is **1.2** m^2. A force of **480**N is applied to it. What is the pressure?
Values	Force = **480 N**. Area= **1.2 m^2**
Equation	Pressure = Force ÷ Area
Substitute	Pressure = **480** ÷ **1.2**
Rearrange	Not needed for this question
Answer	Pressure = 400
Units	**Pa**

400 Pa

Pressure = Force ÷ Area

	The surface area of an object is 1.1 m^2. A force of 5.5 N is applied to it. What is the pressure?
Values **E**quation **S**ubstitute **R**earrange **A**nswer **U**nits	Not needed for this question

Pressure = Force ÷ Area

	If the pressure on an object is **40 Pa** and the surface area is **8 m²**, what is the force being applied?
Values	Pressure = **40 Pa**. Area= **8 m²**
Equation	Pressure = Force ÷ Area
Substitute	**40** = Force ÷ **8**
Rearrange	**40 x 8** = Force ÷ **8 x 8** **40 x 8** = Force
Answer	320 = Force
Units	**N**

320 N

What is the next step?

1. 3 = Force ÷ 5
2. 6 = Force ÷ 9
3. 1.2 = Force ÷ 3.4
4. 7 = Force ÷ 10
5. 6.5= Force ÷ 3

Pressure = Force ÷ Area

	If the pressure on an object is 3.5 Pa and the surface area is 4 m^2, what is the force being applied?
Values **E**quation **S**ubstitute **R**earrange **A**nswer **U**nits	

Independent Practice

Values

Equation

Substitute

Rearrange

Answer

Units

1. What is the pressure of a force of 100 N exerted on a surface area of 10 m^2?
2. What is the pressure of a force of 25000 N exerted on a surface area of 50 m^2?
3. The surface area of an object is 0.08 m^2. Its weight is 120 N. What is the pressure?
4. If the pressure on an object is 4 Pa and the surface area is 2m^2, what is the force being applied?
5. The surface area of an object is 0.5m^2. The pressure is 20 Pa. What force is being applied?
6. An object applies a force of 60 N to a surface area of 15 m^2. What is the pressure?

Calculating Speed

Speed	=	distance	÷	time
(**m/s**)		(**m**)		(**s**)
(mile/h)		(**mile**)		(**h**)
(**km/h**)		(**km**)		(**h**)

Speed = distance ÷ time

	An object travels 90 m in 20s. What is its speed?
Values	distance = **90 m**. time= **20** s
Equation	Speed = distance ÷ time
Substitute	Speed = **90** ÷ **20**
Rearrange	Not required for this question
Answer	Speed = 4.5
Units	**m/s**

4.5 m/s

Speed = distance ÷ time

	If an object travels for 350s and travels 7000m, what is its speed?
Values **E**quation **S**ubstitute **R**earrange **A**nswer **U**nits	Not required for this question

Speed = distance ÷ time

	If an object travels for 0.08s at a speed of 62m/s how far has it travelled?
Values	speed = **62 m/s**. time= **0.08** s
Equation	Speed = distance ÷ time
Substitute	**62** = distance ÷ **0.08**
Rearrange	**62 x 0.08** = distance ÷ **0.08 x 0.08** **62 x 0.08** = distance
Answer	4.96 = distance
Units	**m**

4.96 m

Speed = distance ÷ time

	An object travels at a speed of 2m/s for 170s. How far has it travelled in m?
Values **E**quation **S**ubstitute **R**earrange **A**nswer **U**nits	

Independent Practice

Values

Equation

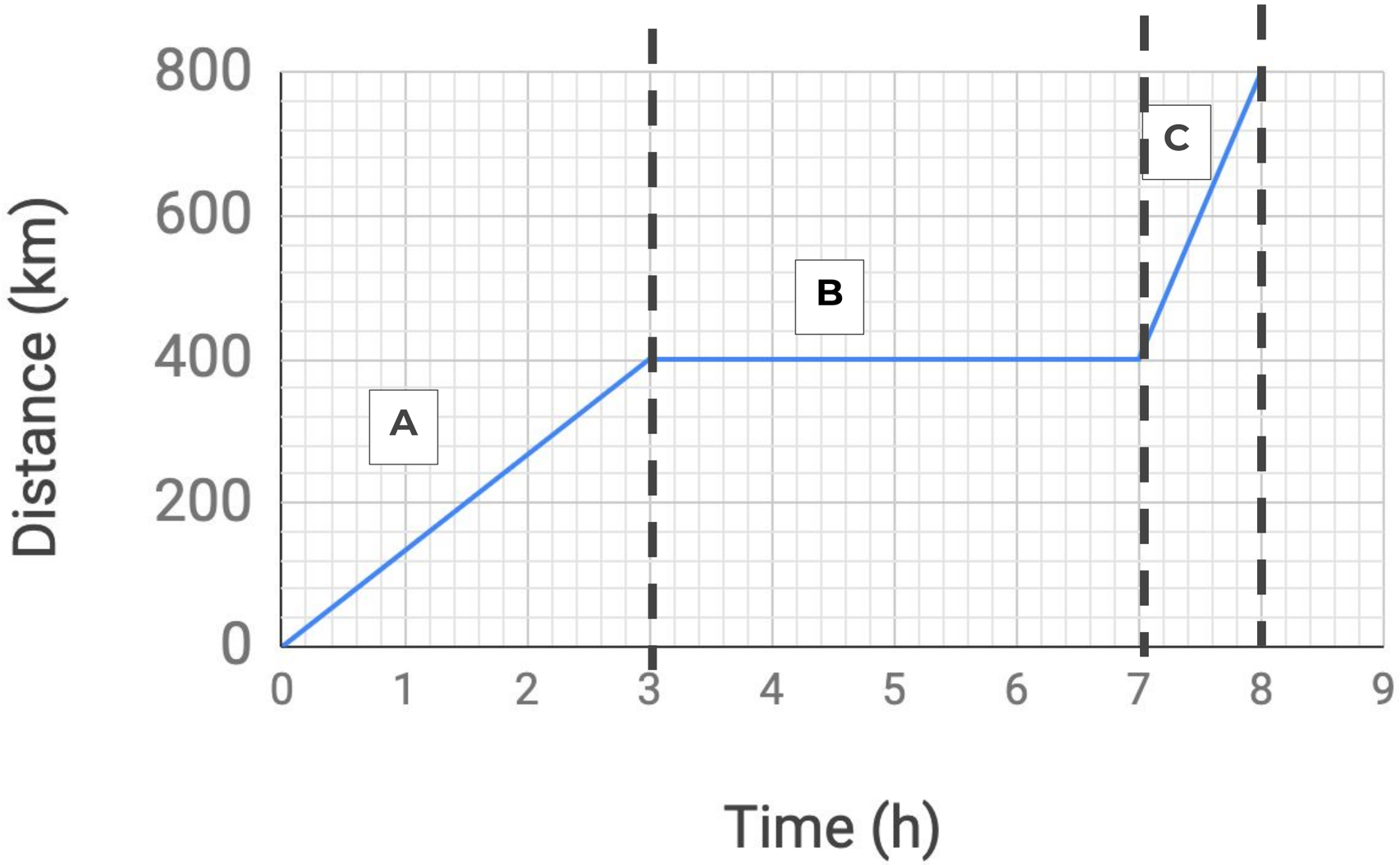
Substitute

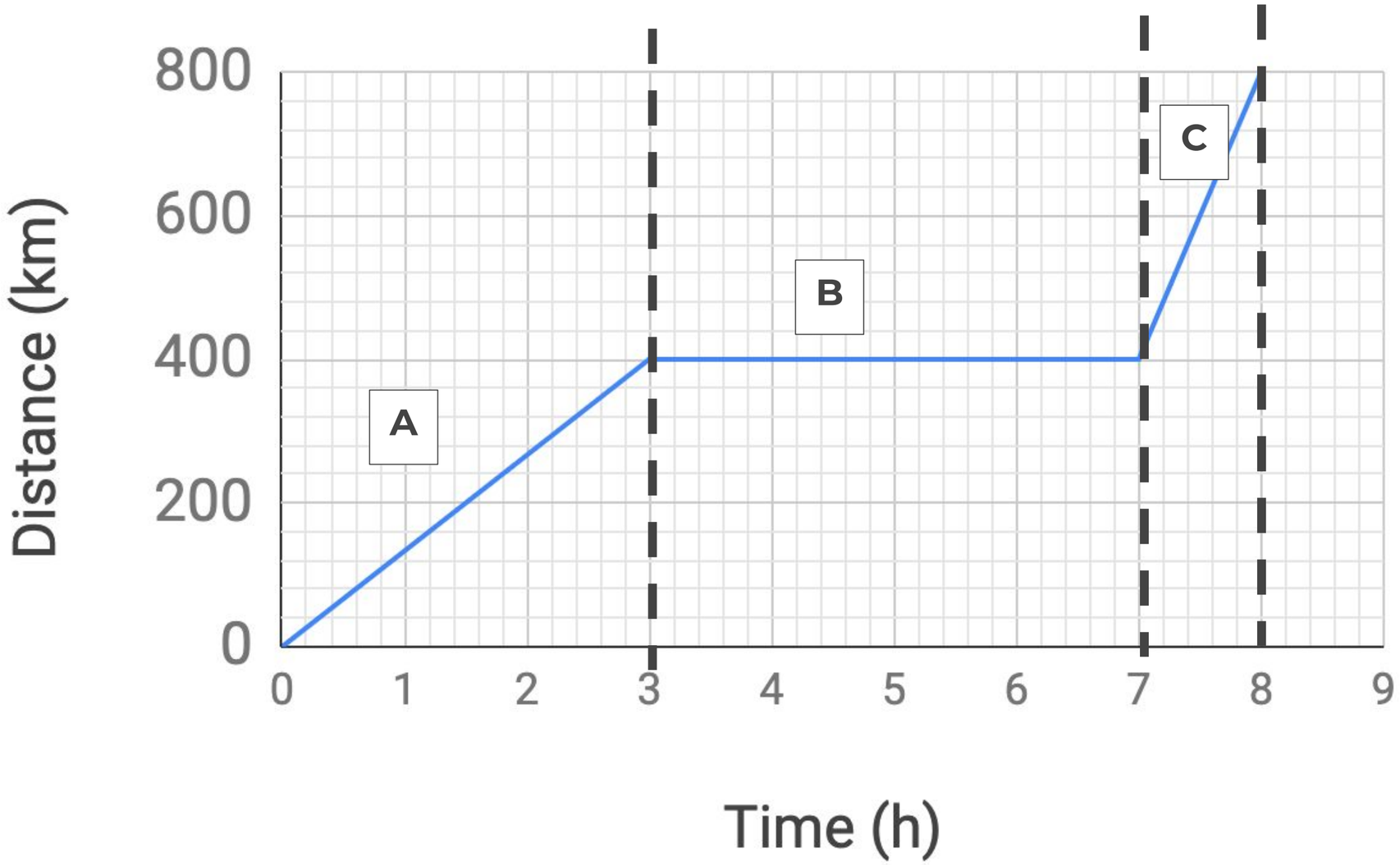
Rearrange

Answer

Units

1. In 180 s, an object travels 720 m. What is its speed?
2. In a journey lasting 630 s, a car travels 5355 m. What was its speed?
3. An object travels 9100 m in 350 s . What is its speed?
4. What is the distance travelled by an object travelling at 70m/s for 200 s ?
5. An object travels at a speed of 10 m/s for 60 s. How far has it travelled in m?
6. If an object travels for 3400 s at a speed of 12 m/s how far has it travelled?


Distance (km)
800
600
400
200
0
0
1
2
3
4
5
6
7
8
9
Time (h)
A
B
C



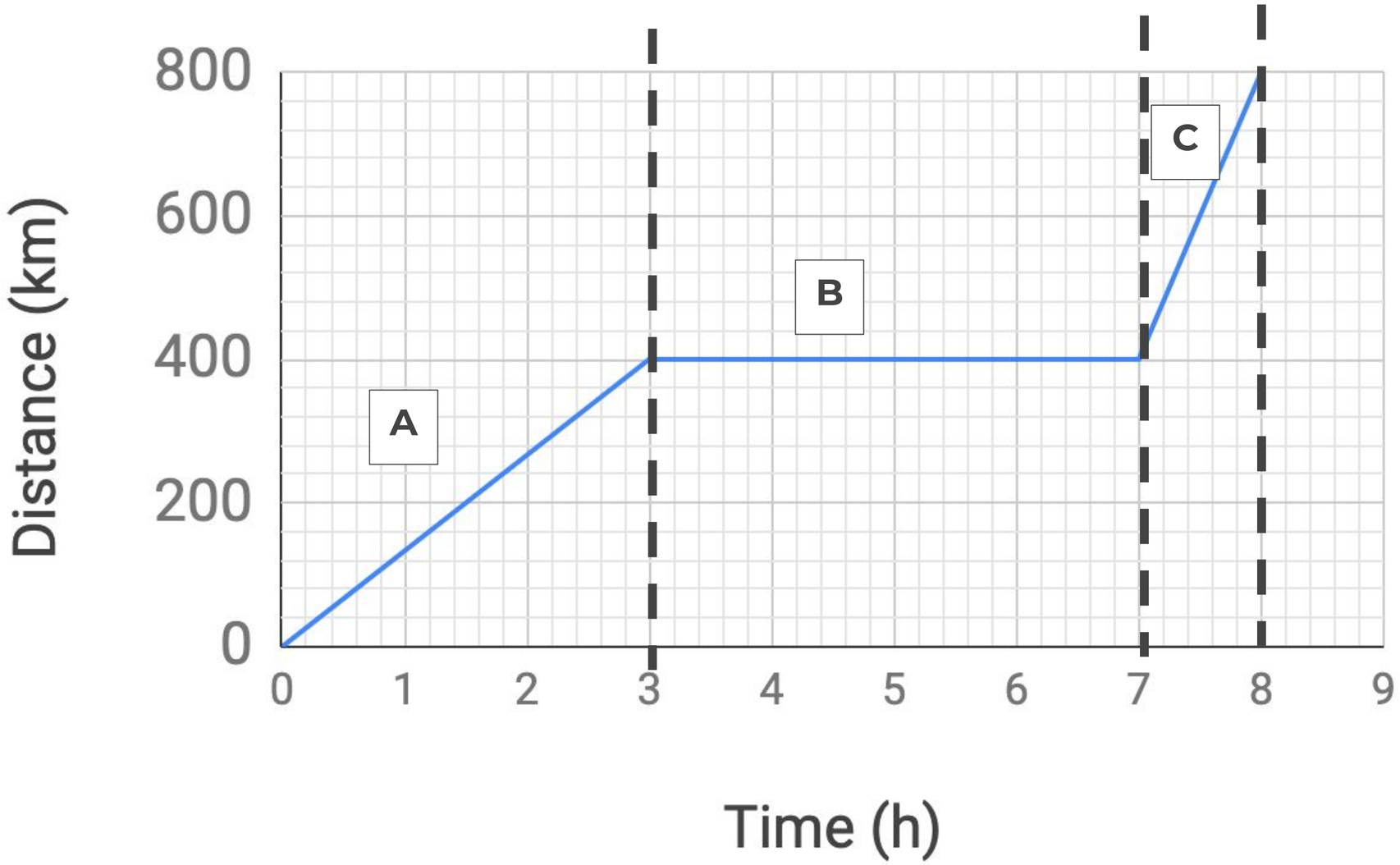
Total Distance = **800** km

Time = **8** h

Speed = Distance ÷ time

Speed = **800** ÷ **8**

Speed = 100 km/h



Section **A**

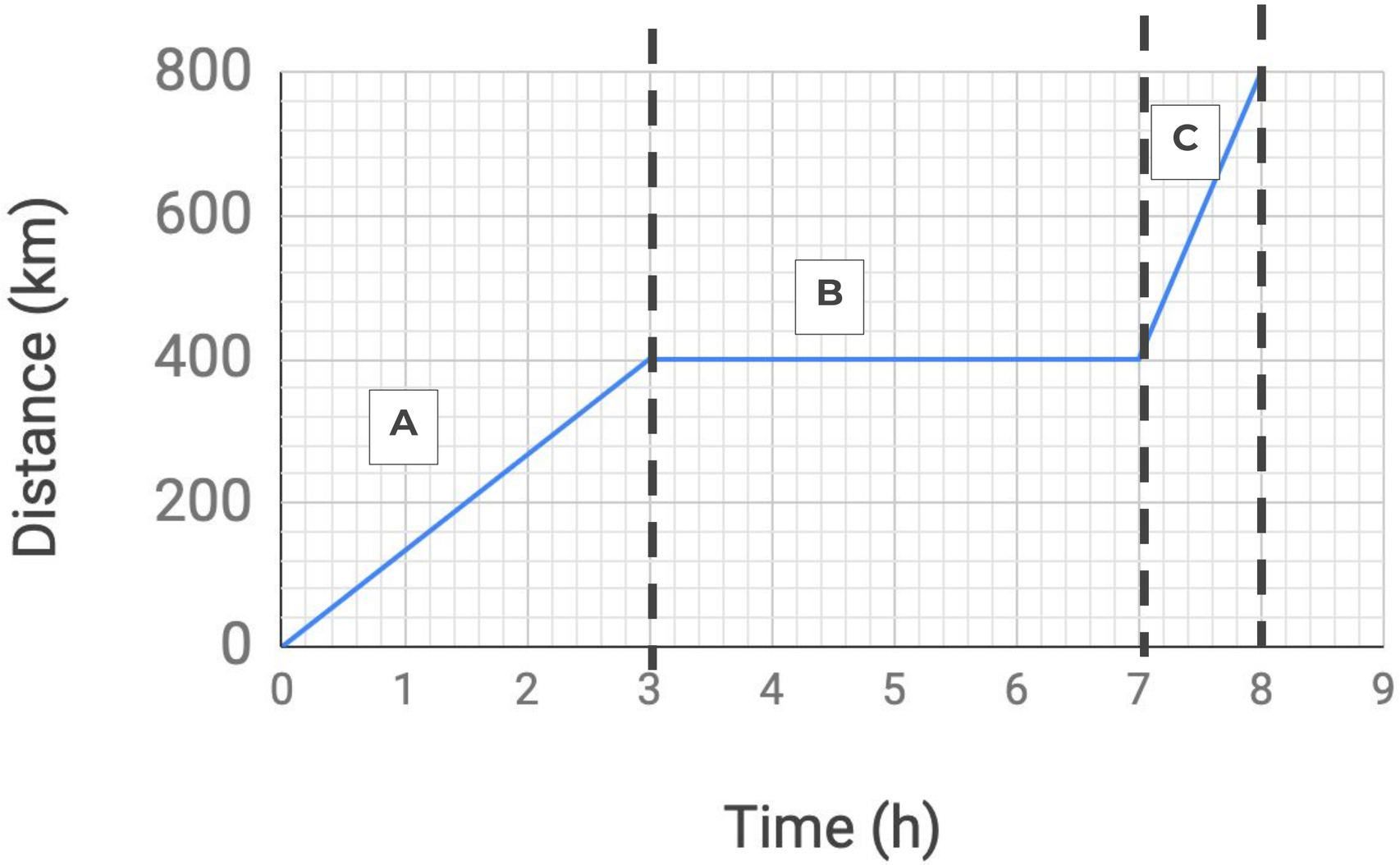
Distance = **400** km

Time = **3** h

Speed=Distance ÷ time

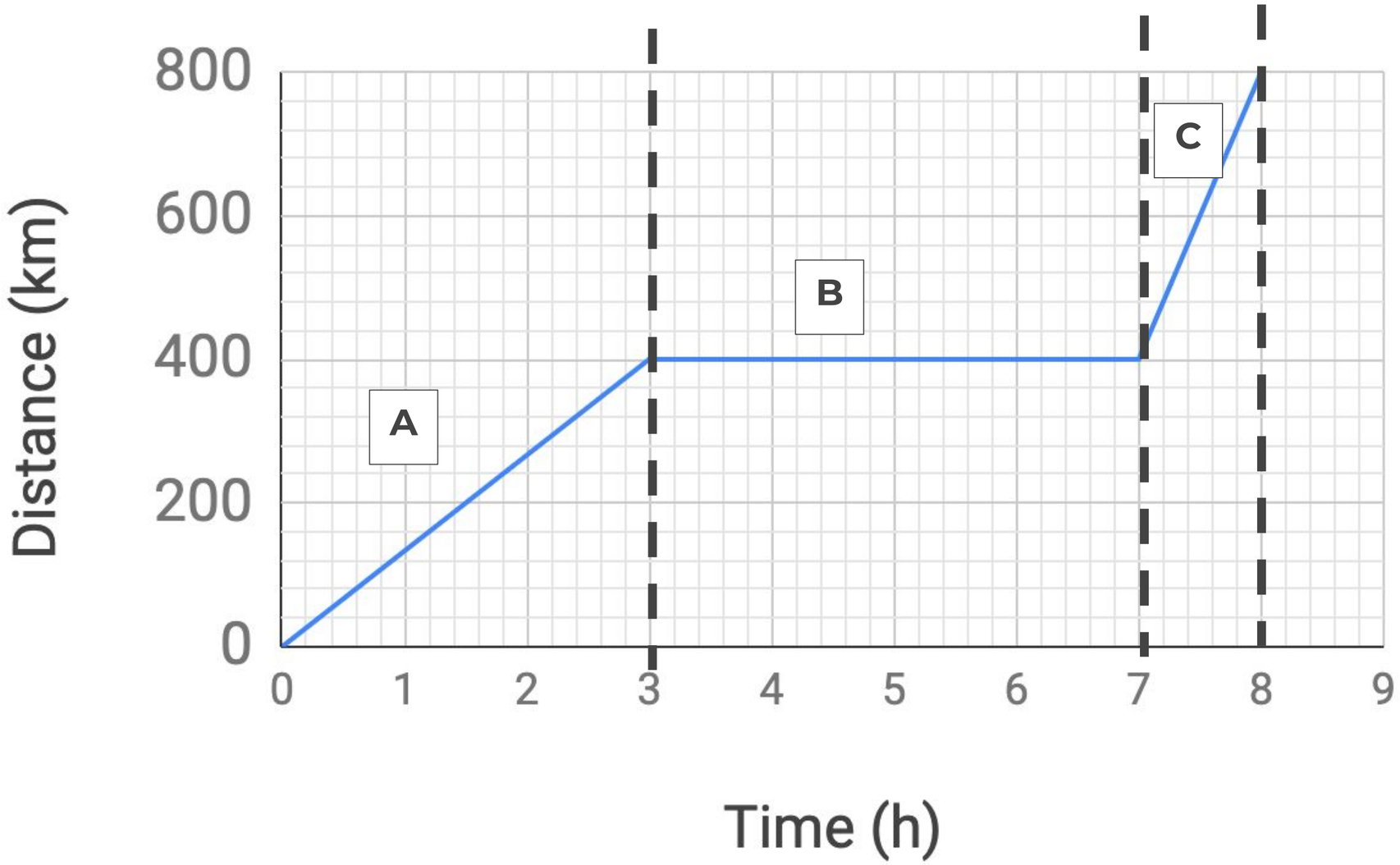
Speed = **400** ÷ **3**

Speed = 133 km/h



Section **B**

0 km/h



Section **C**

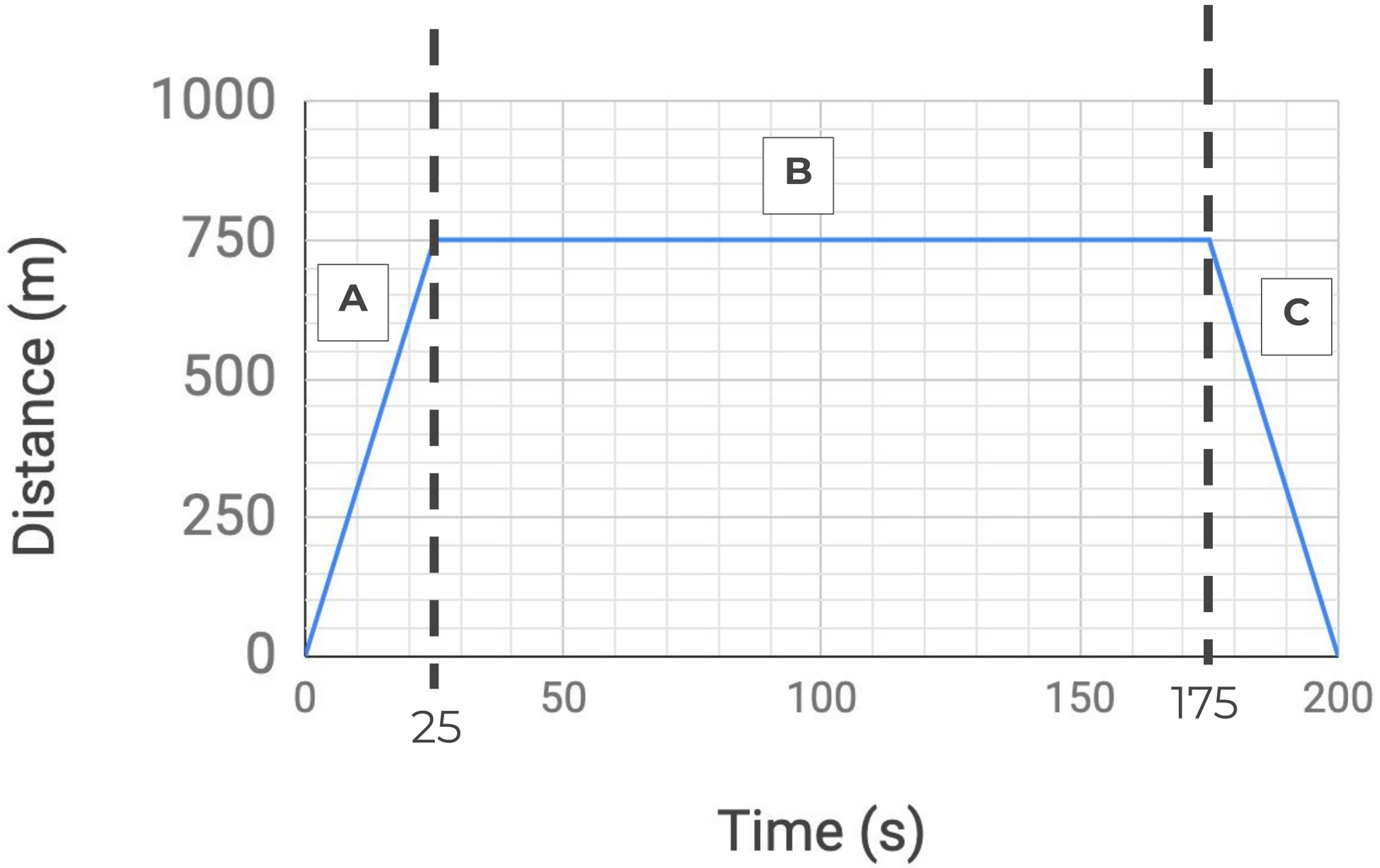
Distance = **800 - 400 = 400** km

Time = **8 - 7 = 1** h

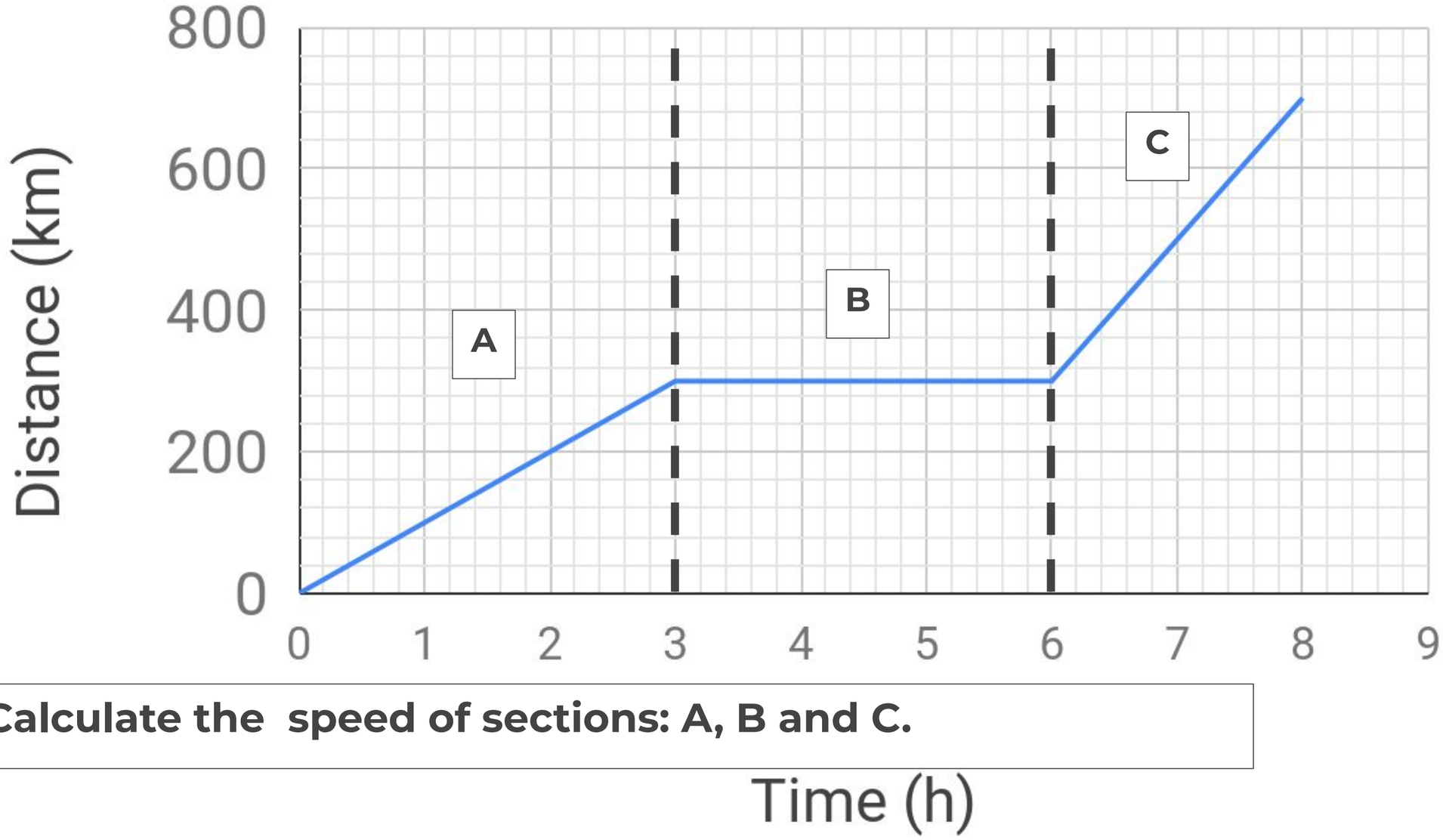
Speed=Distance ÷ time

Speed = **400** ÷ **1**

Speed = 400km/h



Calculate the speed of sections: A, B and C.



Calculate the speed of sections: A, B and C.

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