Lesson 12 - Calculating speed using distance-time graphs

Physics - KS3

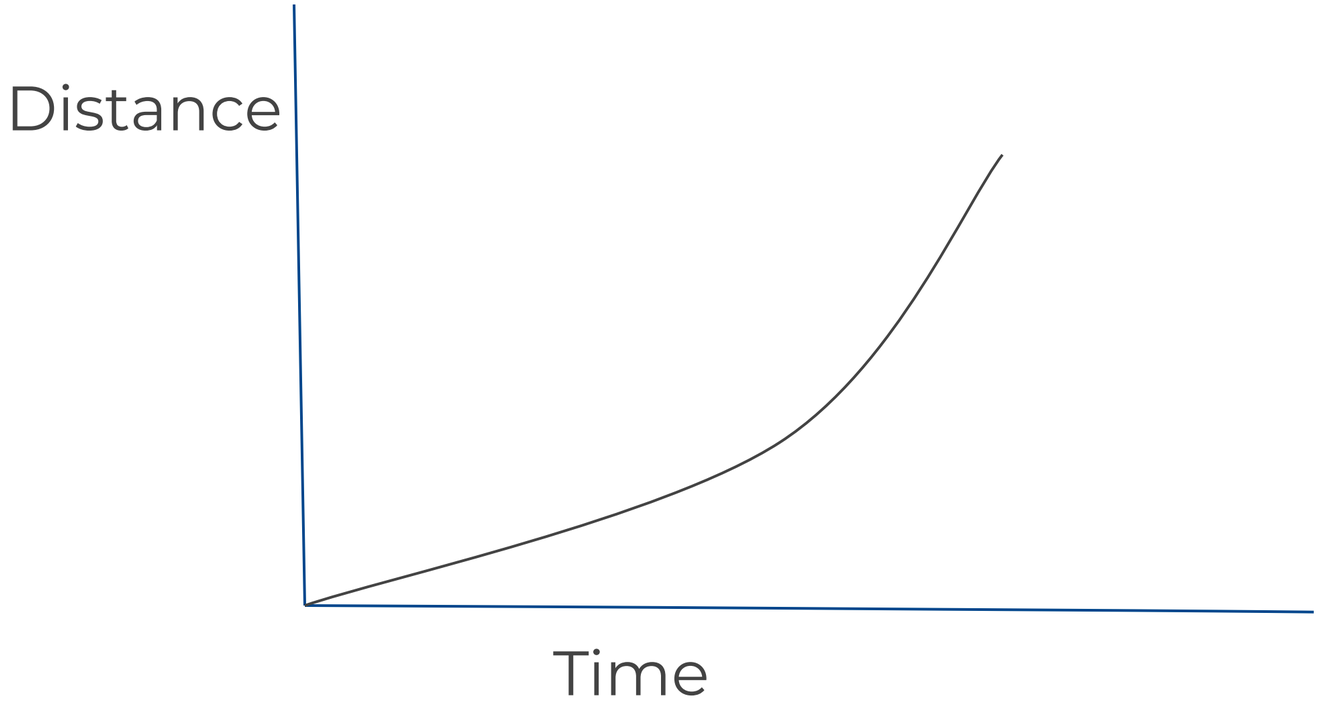
Forces and Motion

Mrs Wolstenholme

Constant speed

At rest

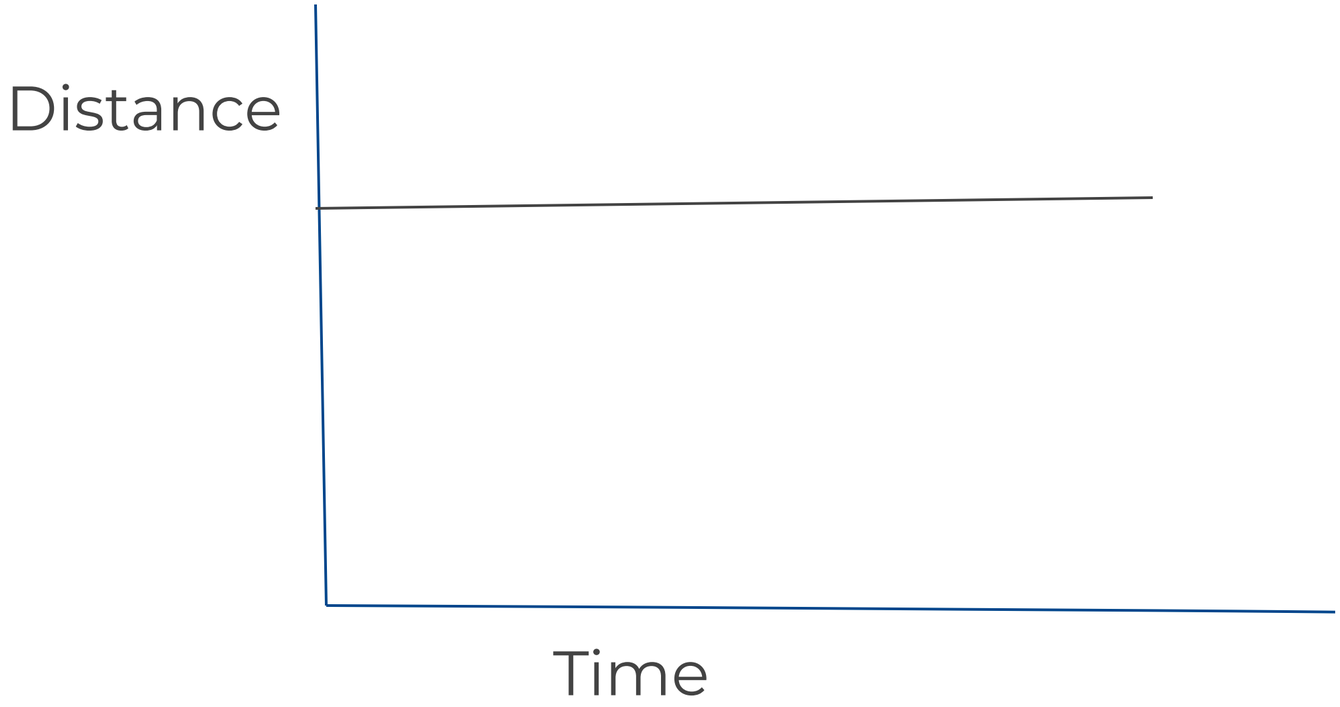
Accelerating



Constant speed

At rest

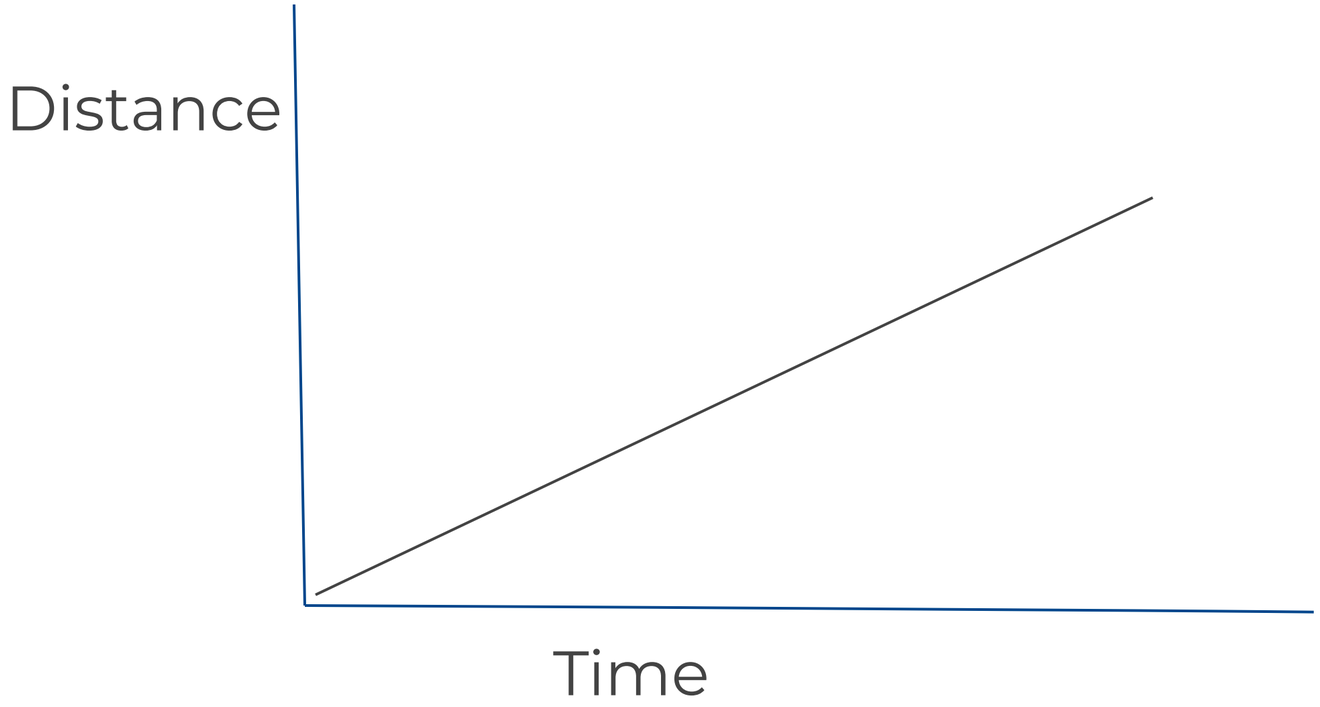
Accelerating

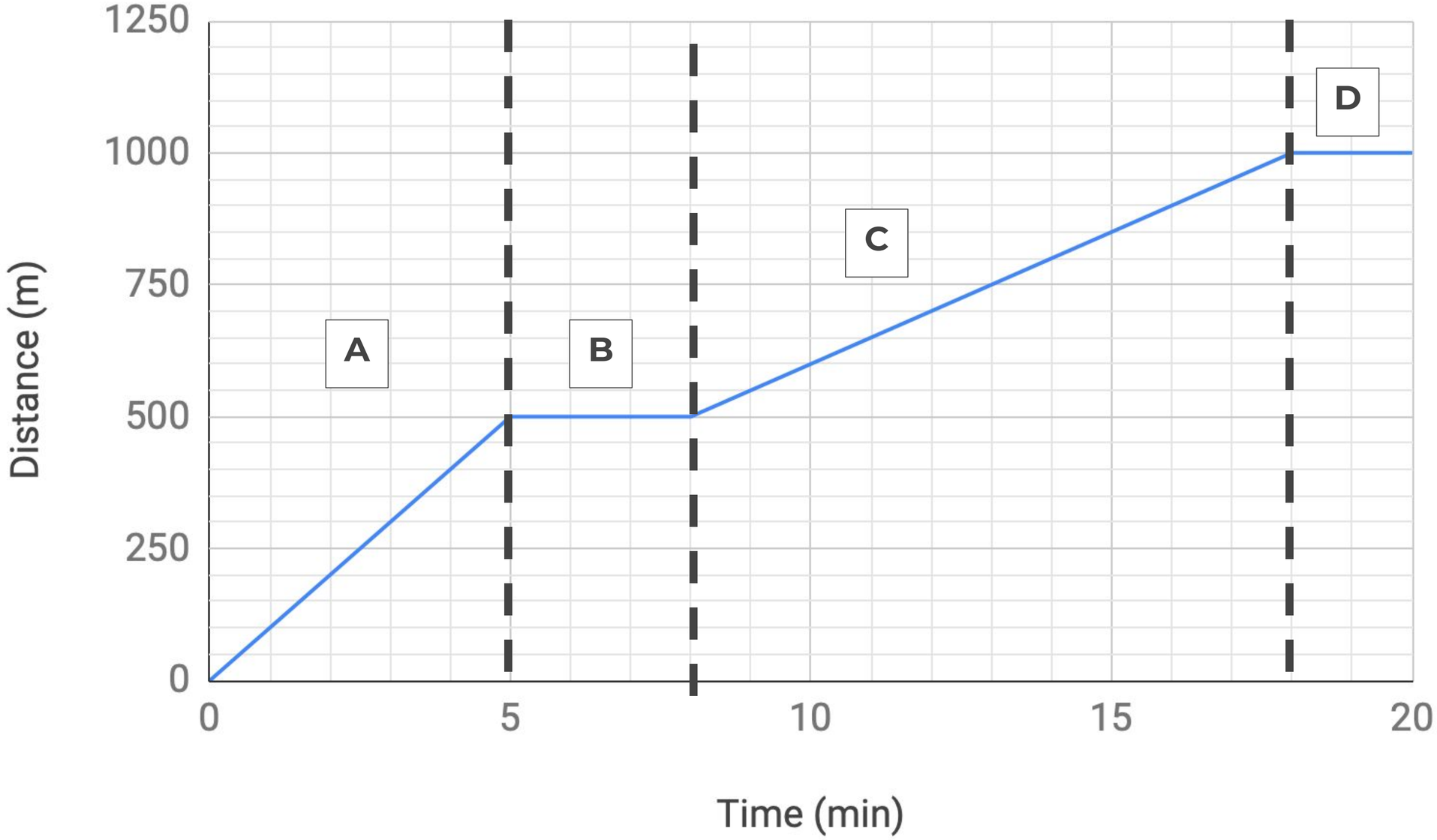


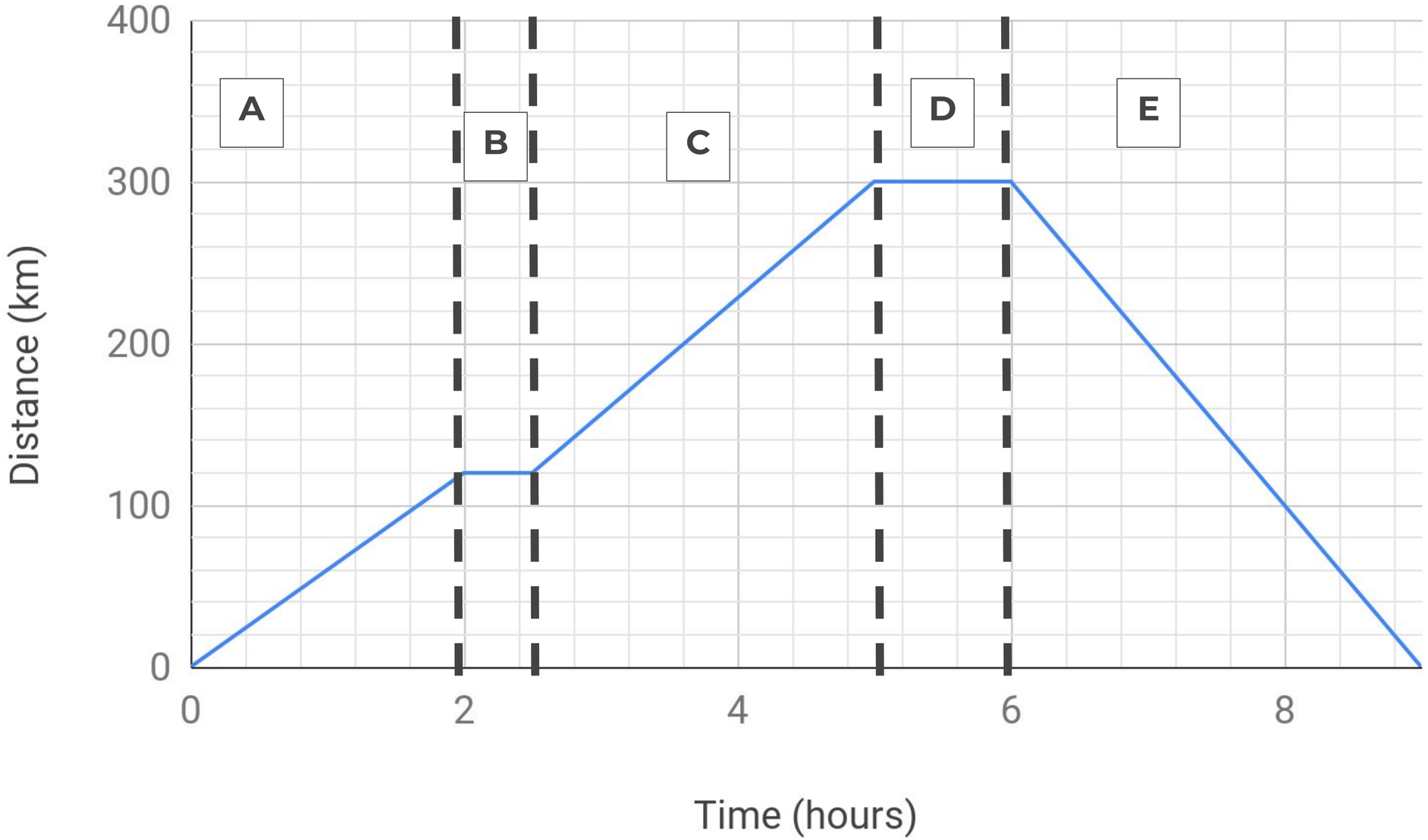
Constant speed

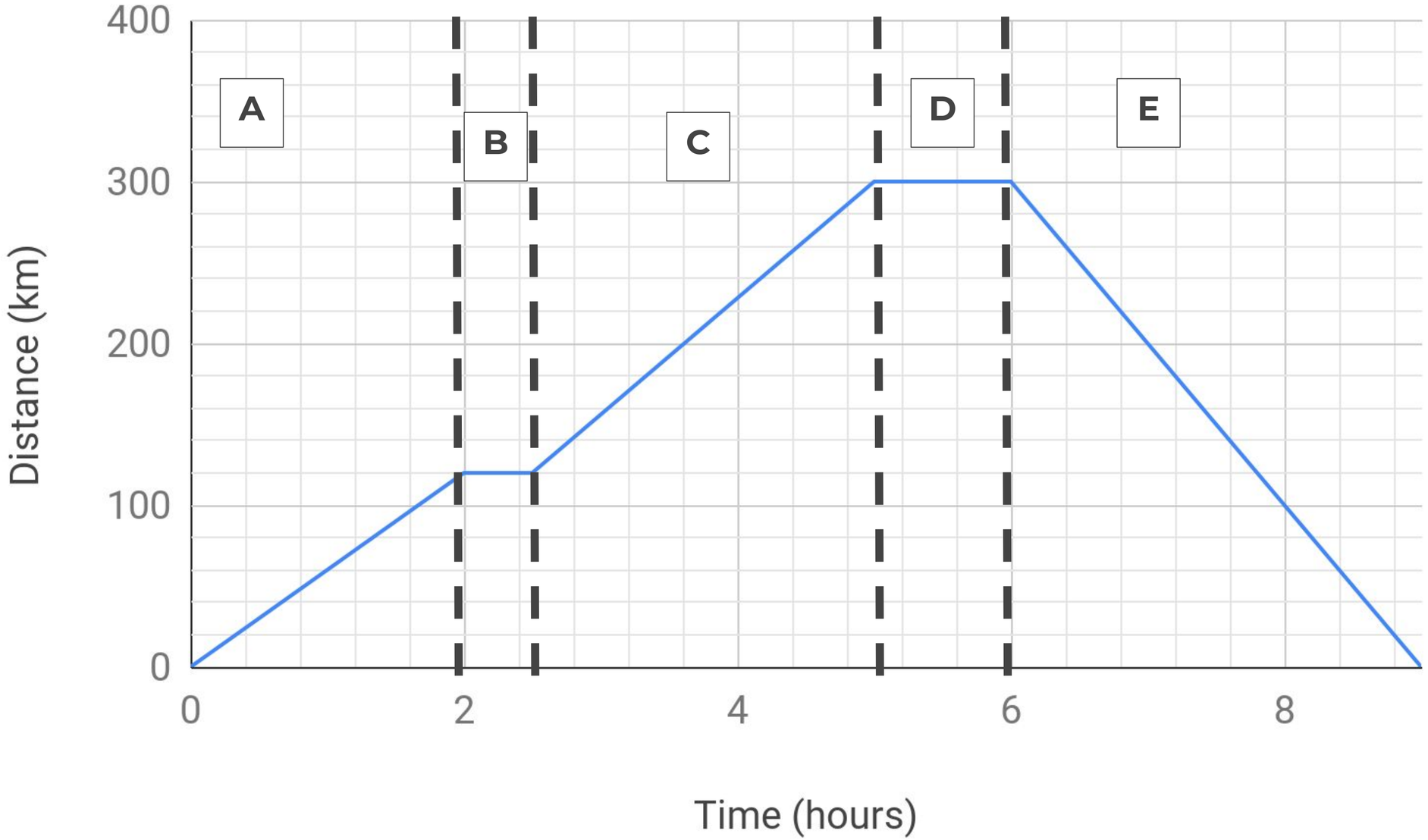
At rest

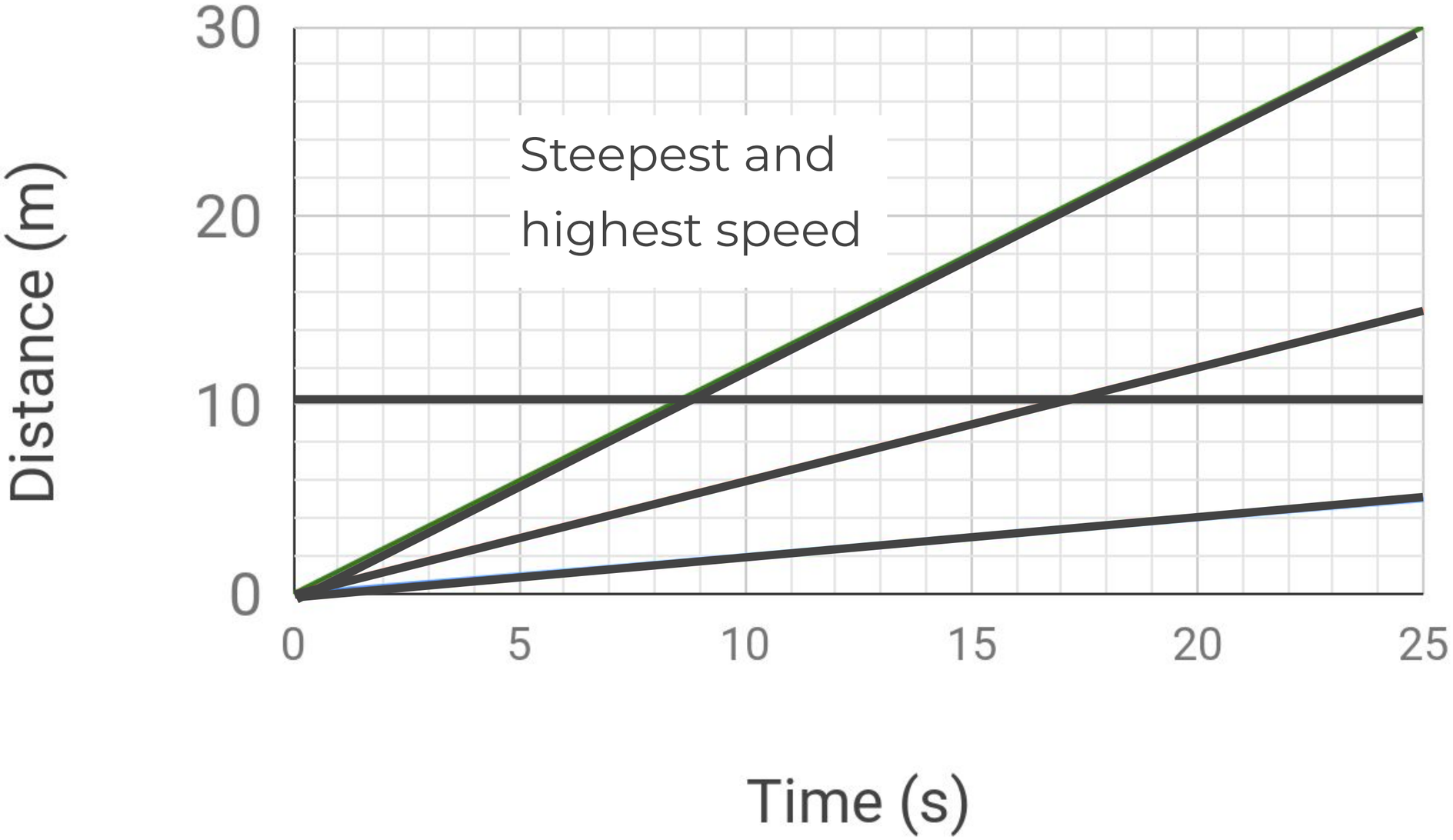
Accelerating

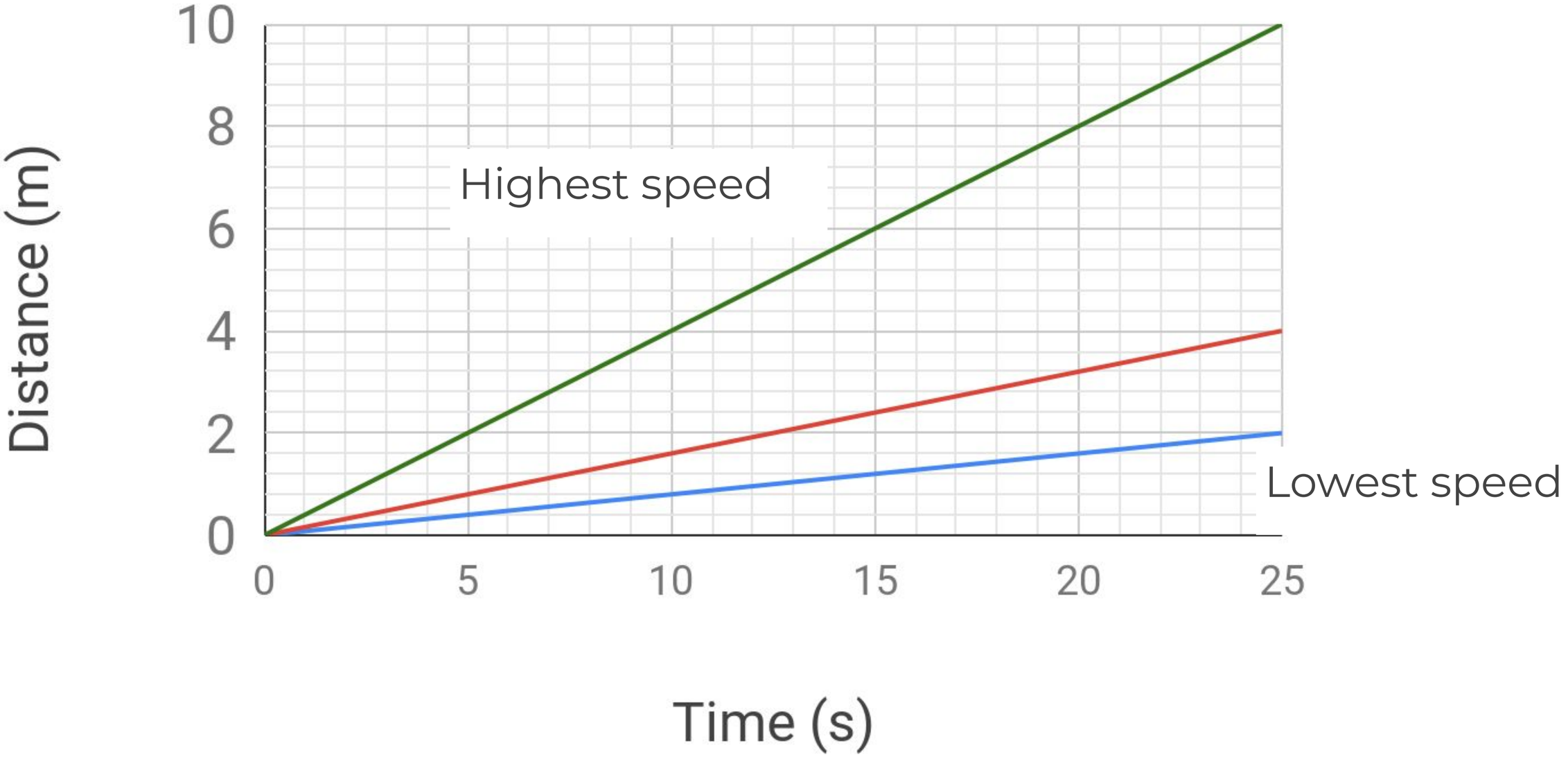



1250
1000
750
500
250
0
Distance (m)
0
5
10
15
20
Time (min)
A
B
C
D

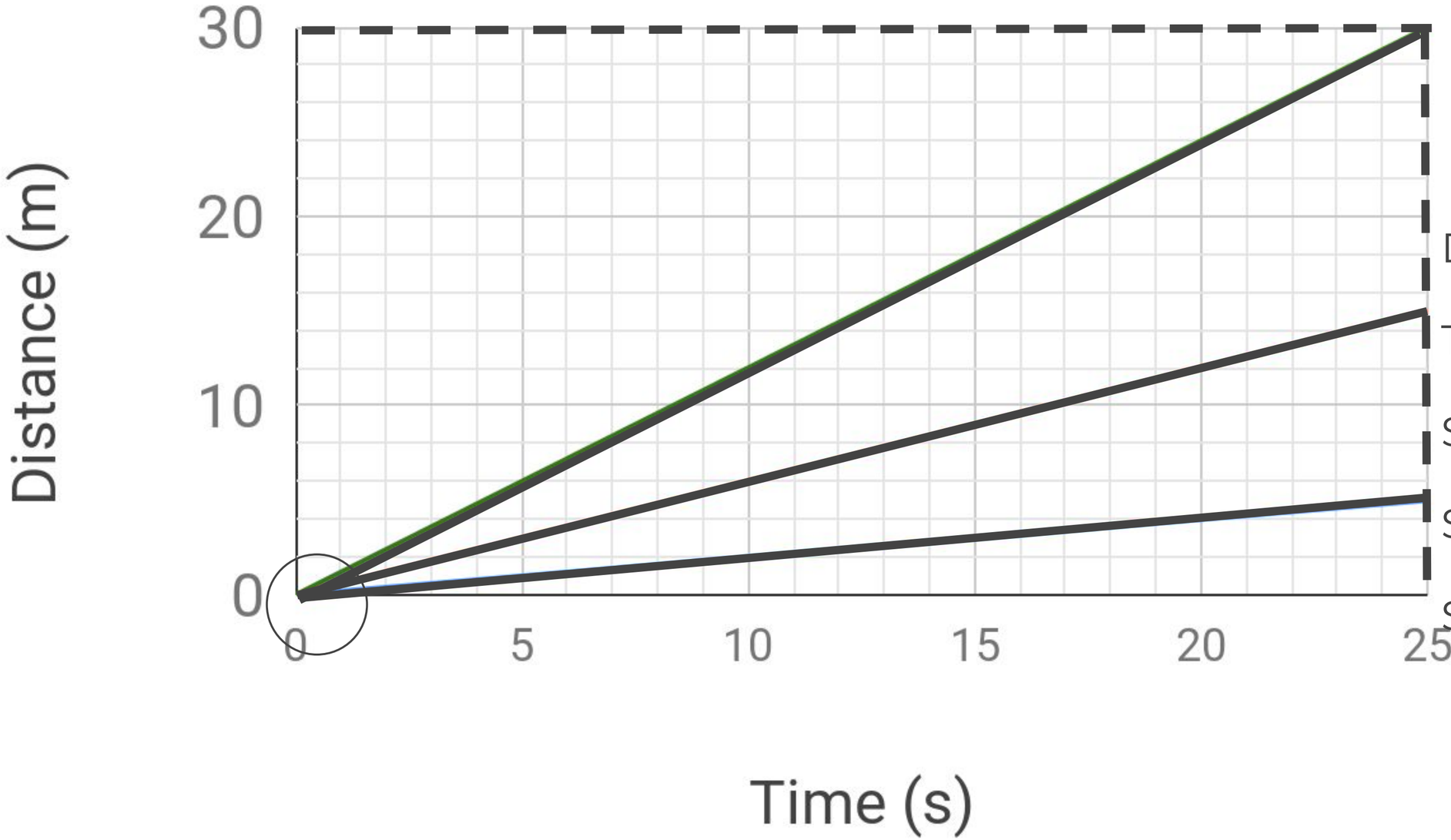

400
300
200
100
0
Distance (km)
A
B
C
D
E
0
2
4
6
8
Time (hours)


400
300
200
100
0
Distance (km)
A
B
C
D
E
0
2
4
6
8
Time (hours)


Distance (m)
30
20
10
0
Steepest and
highest speed
0
5
10
15
20
25
Time (s)


Distance (m)
10
8
6
4
2
0
Highest speed
Lowest speed
0
5
10
15
20
25
Time (s)

Speed = Distance travelled ÷ time



Distance = **30 m**

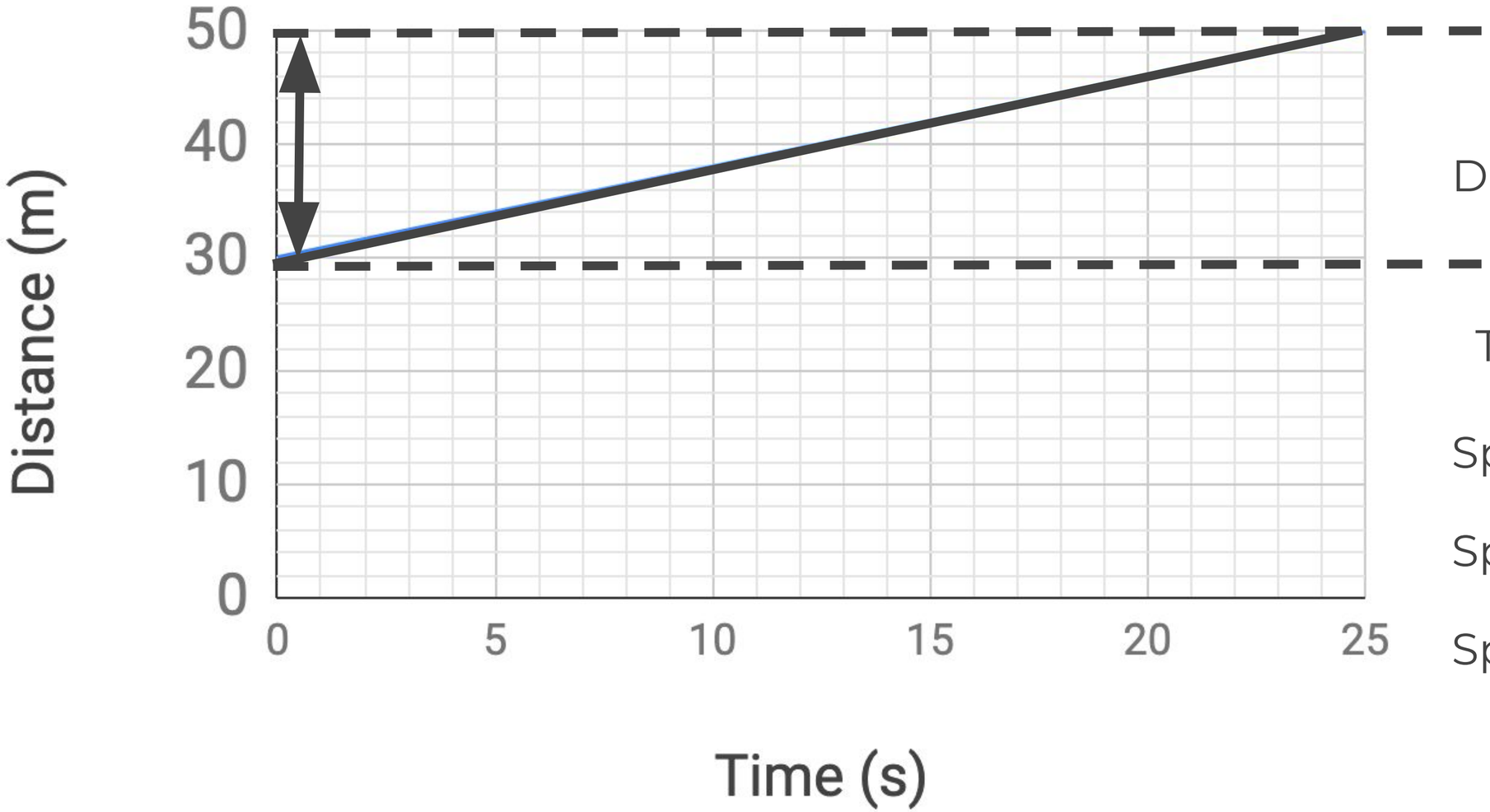
Time = **25 s**

Speed = Distance ÷ time

Speed = **30** ÷ **25**

Speed = 1.2 m/s

Speed = Distance travelled ÷ time



Distance = 50 - 30 = **20** m

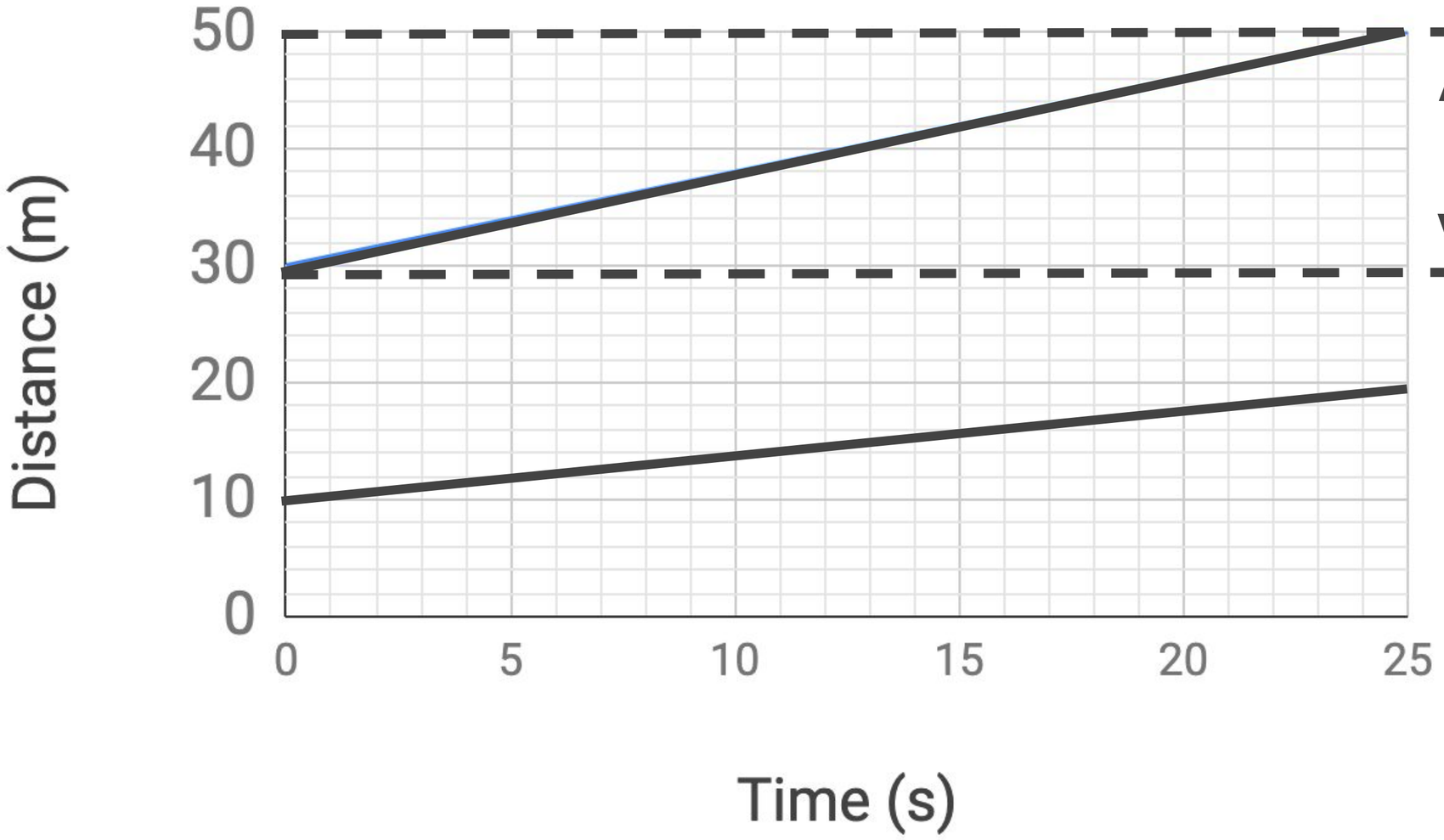
Time = **25** s

Speed = Distance ÷ time

Speed = **20**÷ **25**

Speed = 0.8 m/s

Speed = Distance travelled ÷ time



Distance = 50 - 30 = **20** m

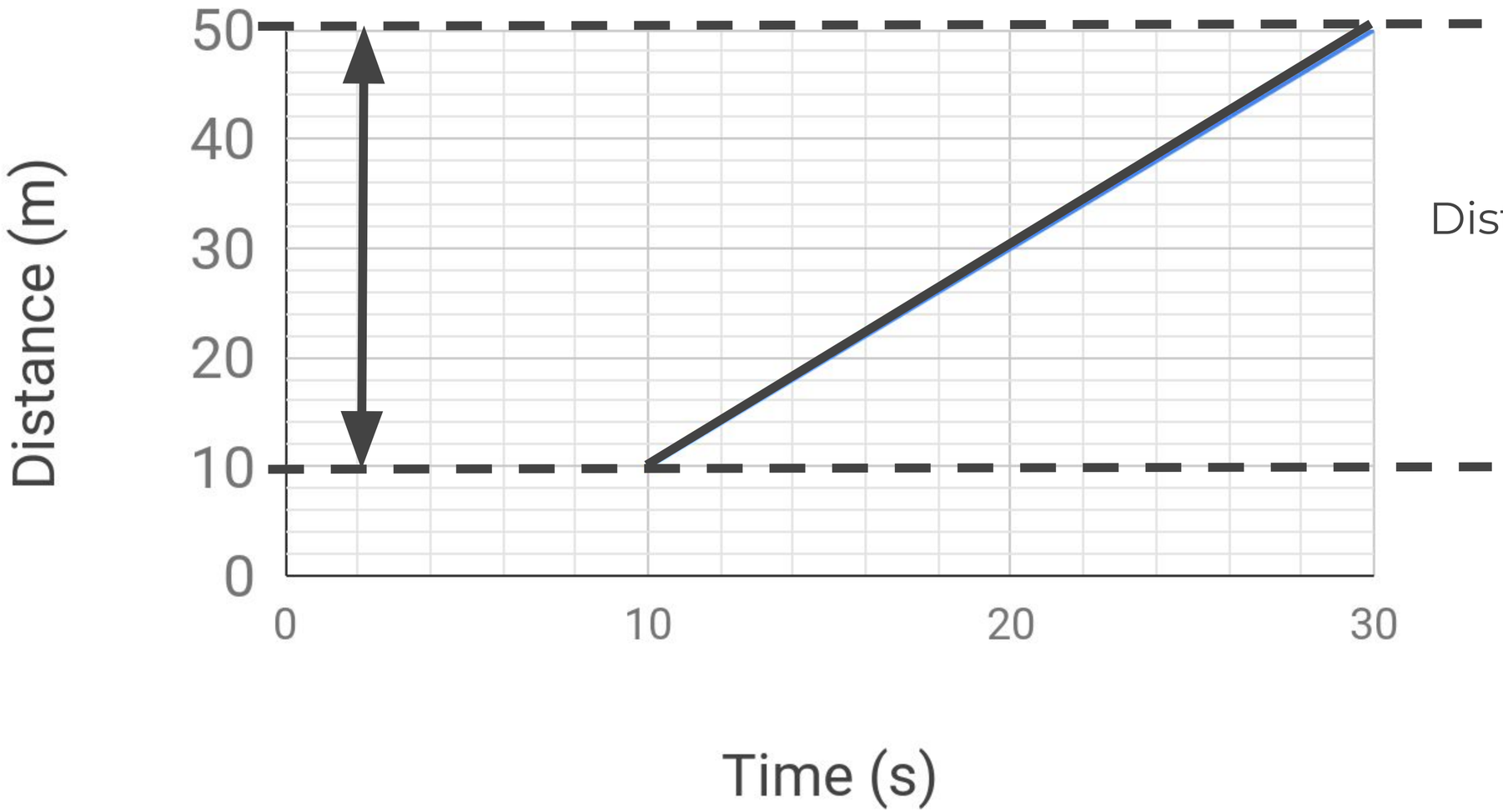
Time = **25** s

Speed = Distance ÷ time

Speed = **20**÷ **25**

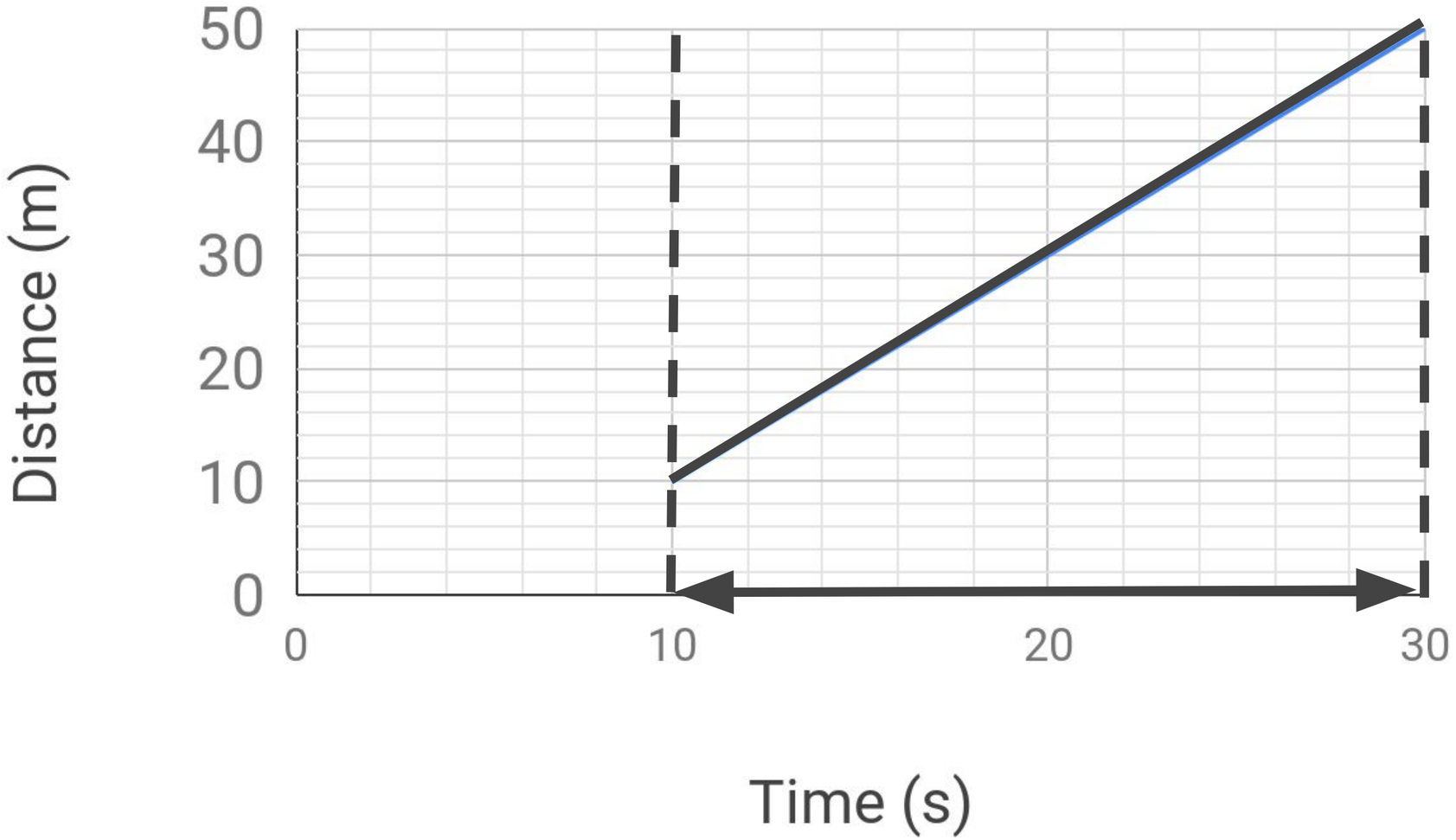
Speed = 0.8 m/s

Speed = Distance travelled ÷ time



Distance = 50 - 10 = **40** m

Speed = Distance travelled ÷ time



Distance = 50 - 10 = **40** m

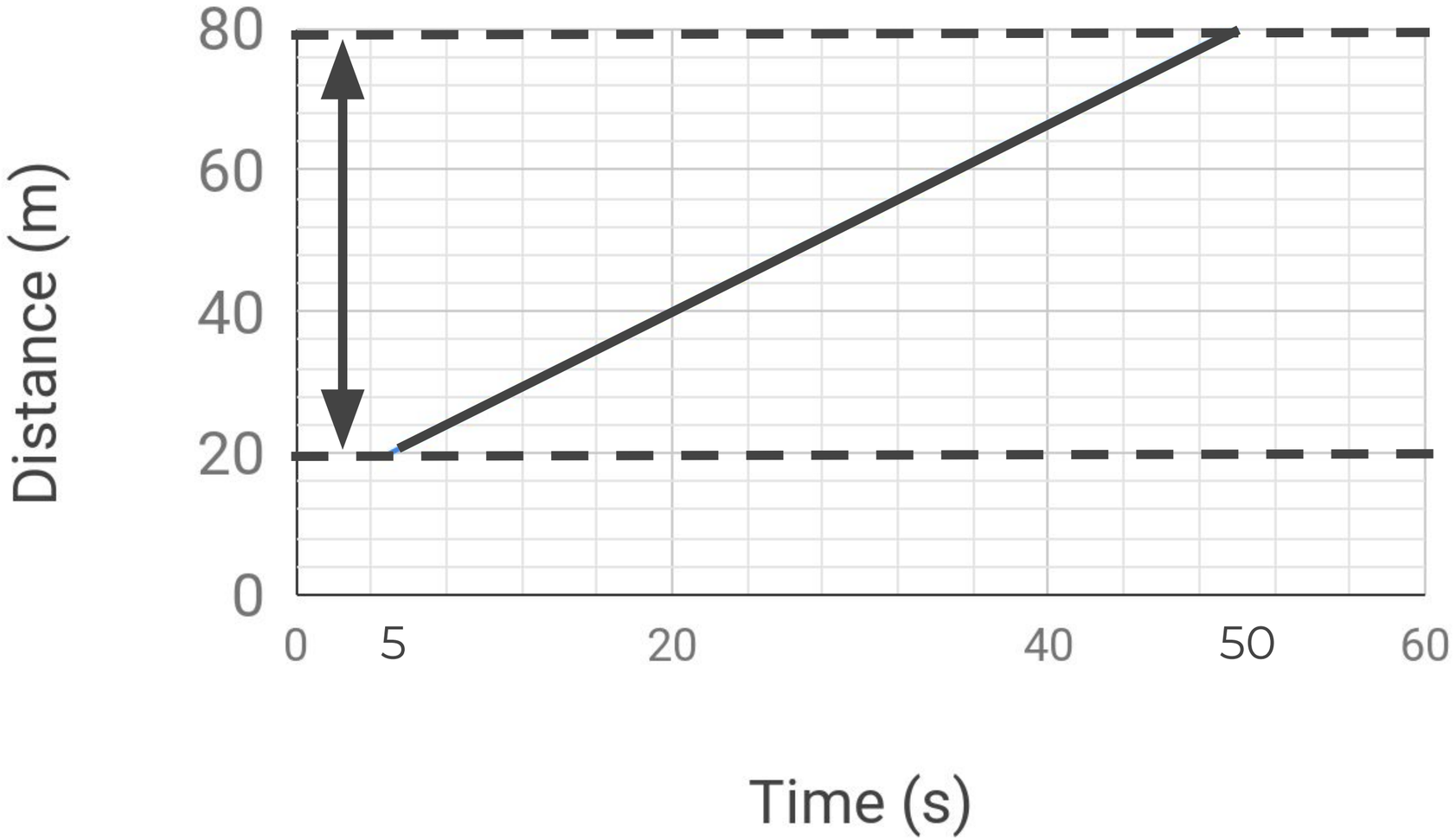
Time = 30 - 10 = **20** s

Speed = Distance ÷ time

Speed = **40**÷ **20**

Speed = 2 m/s

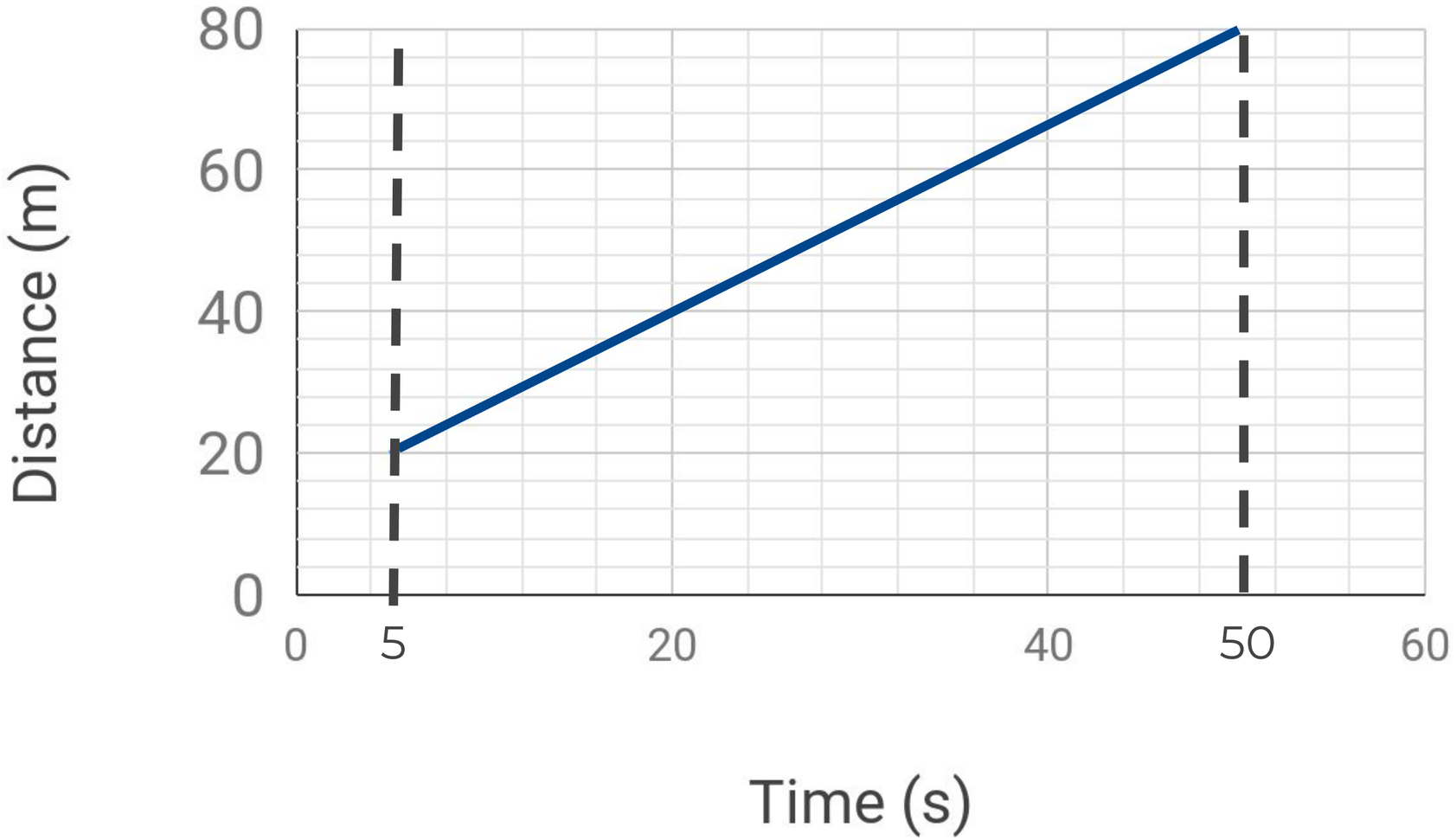
Speed = Distance travelled ÷ time



Distance = 80 - 20 = **60** m

Time =

Speed = Distance travelled ÷ time

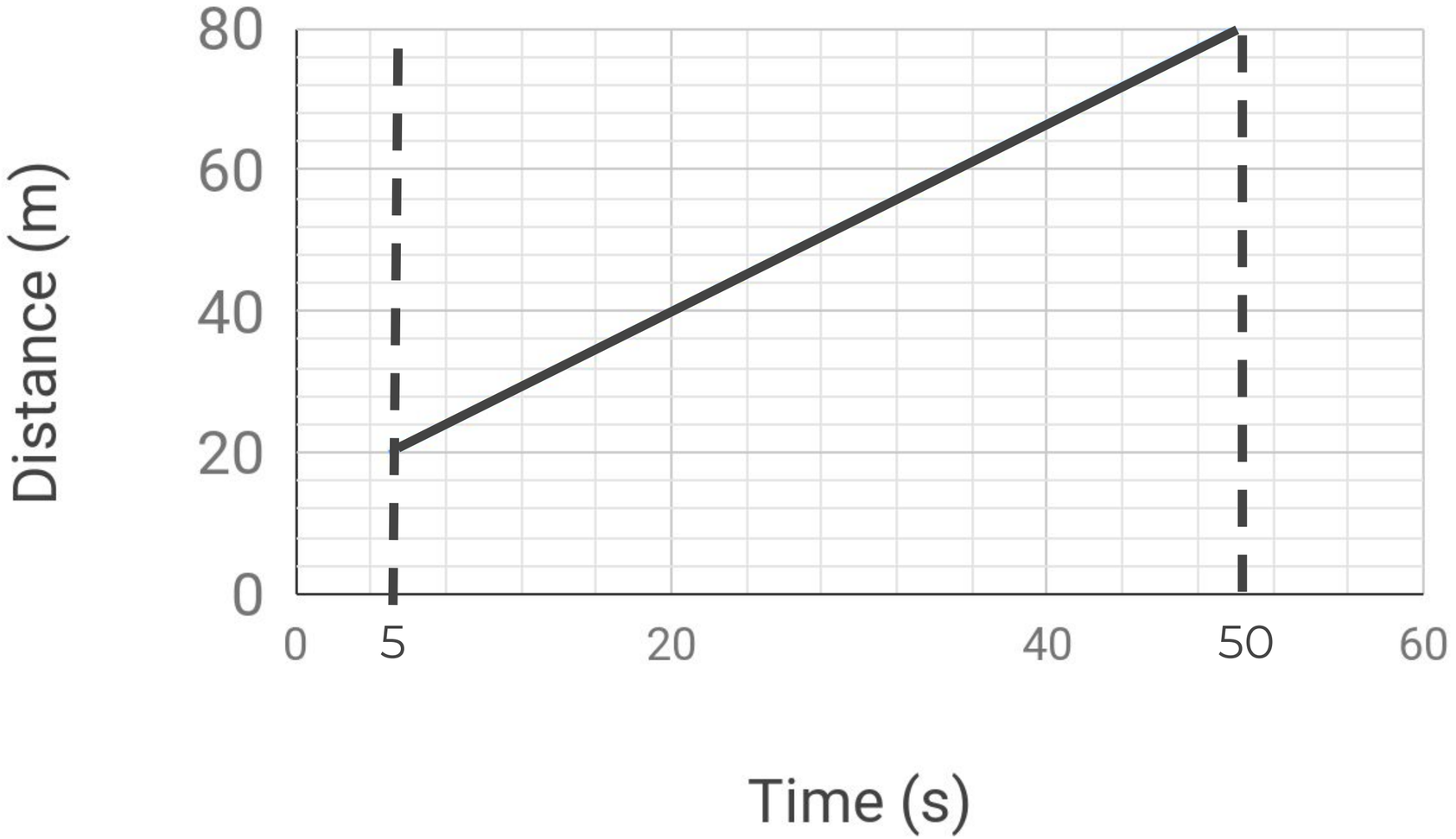


Distance = 80 - 20 = **60** m

Time = 50 - 5 = **45** s

Speed = Distance ÷ time

Speed = Distance travelled ÷ time



Distance = 80 - 20 = **60** m

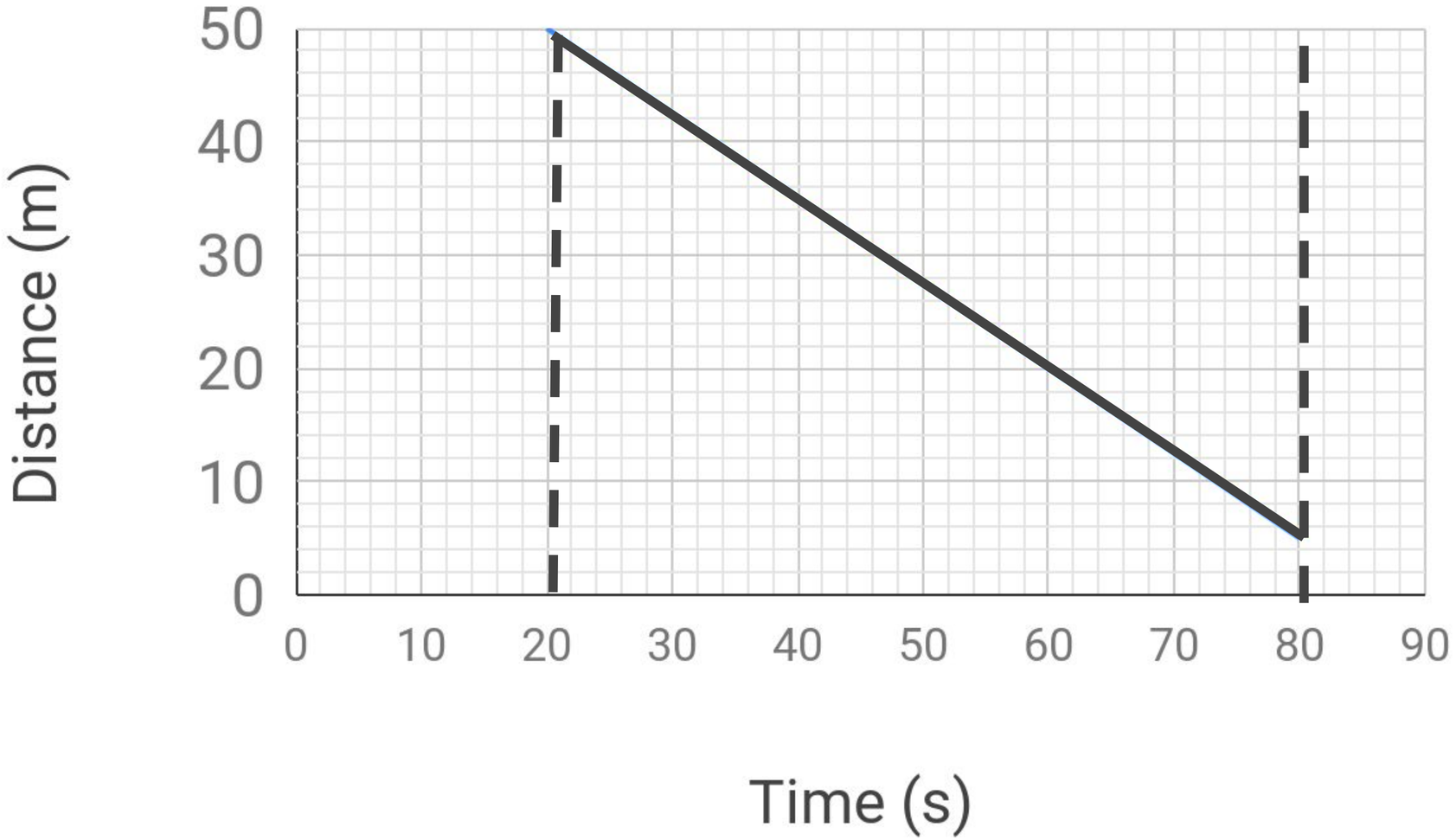
Time = 50 - 5 = **45** s

Speed = Distance ÷ time

Speed = **60**÷ **45**

Speed = 1.33 m/s

Speed = Distance travelled ÷ time



Distance = 50 - 5 = **45** m

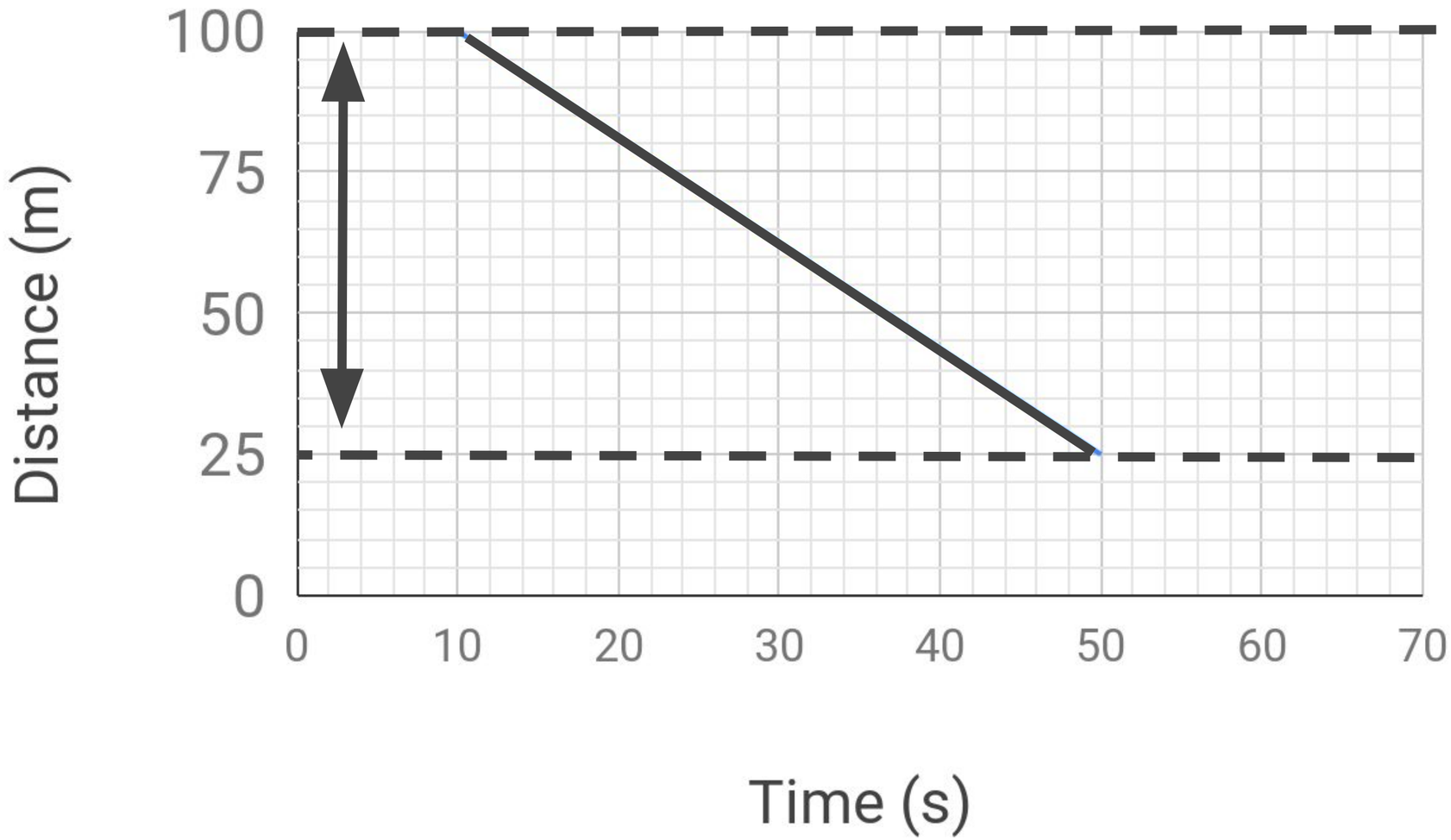
Time = 80 - 20 = **60** s

Speed = Distance ÷ time

Speed = **45** ÷ **60**

Speed = 0.75 m/s

Speed = Distance travelled ÷ time



Distance = 100 - 25 = **75** m

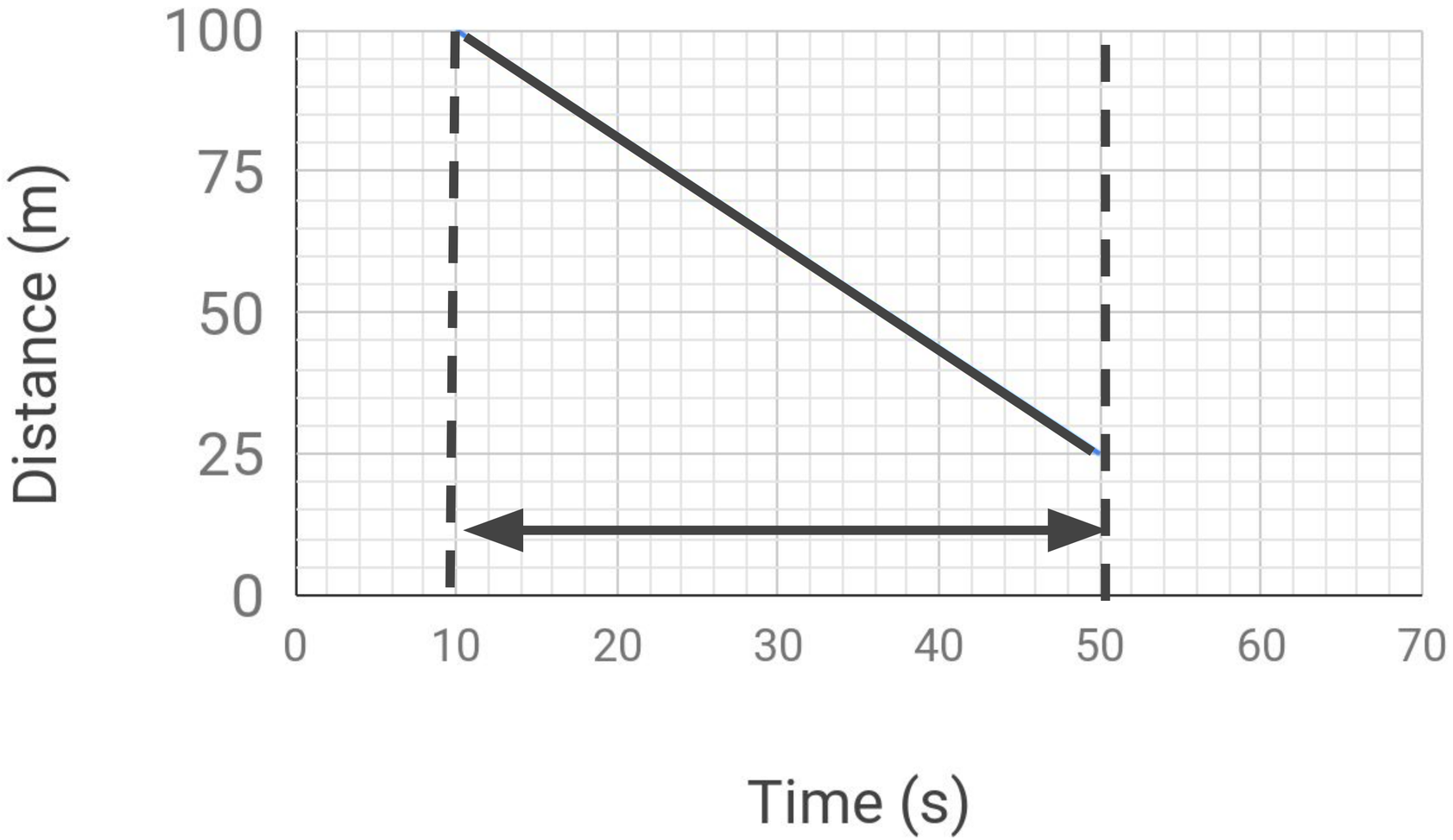
Time = 50 - 10 = **40** s

Speed = Distance ÷ time

Speed = **75** ÷ **40**

Speed = 1.875 m/s

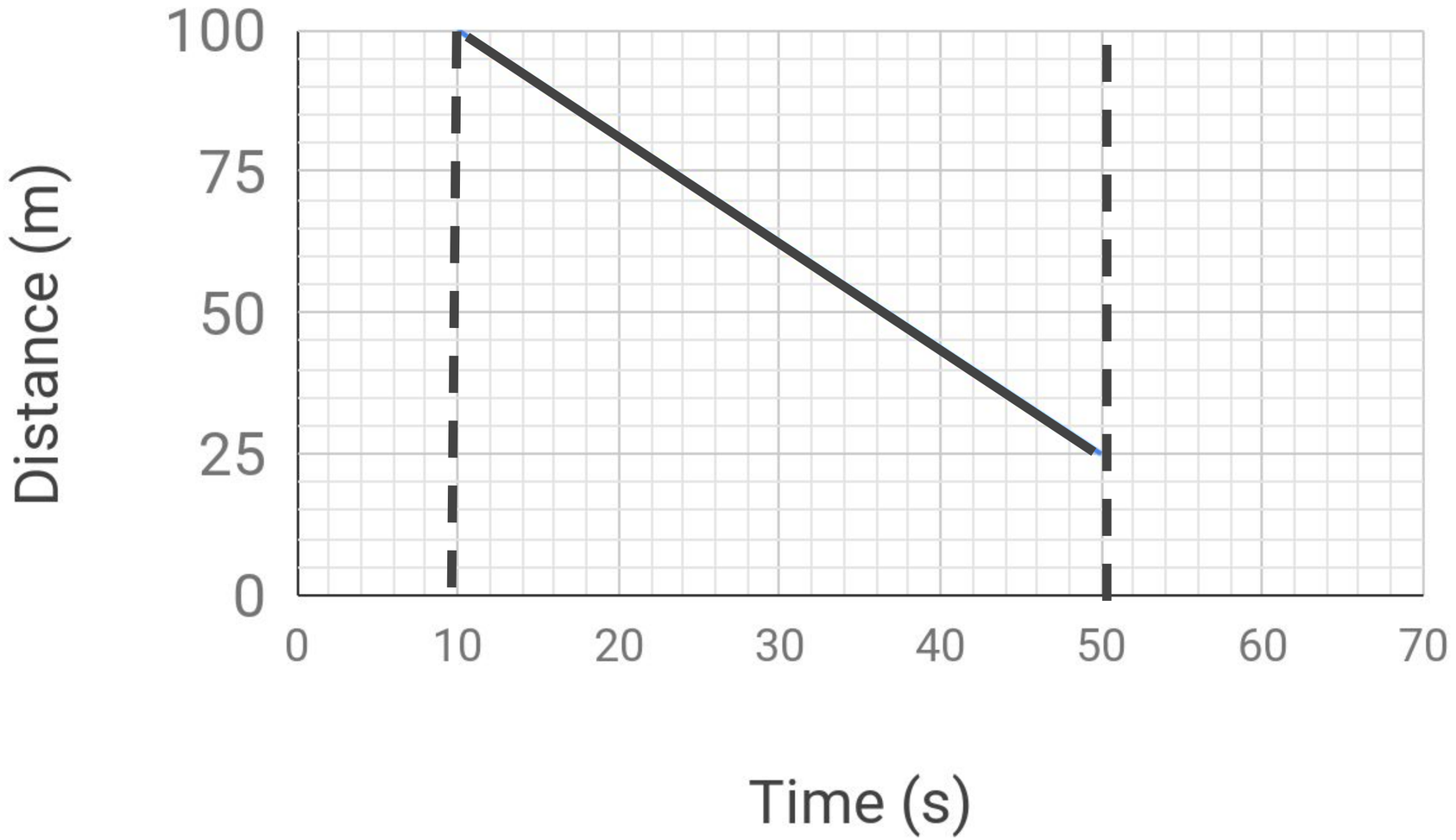
Speed = Distance travelled ÷ time



Distance = 100 - 25 = **75** m

Time = 50 - 10 = **40** s

Speed = Distance travelled ÷ time



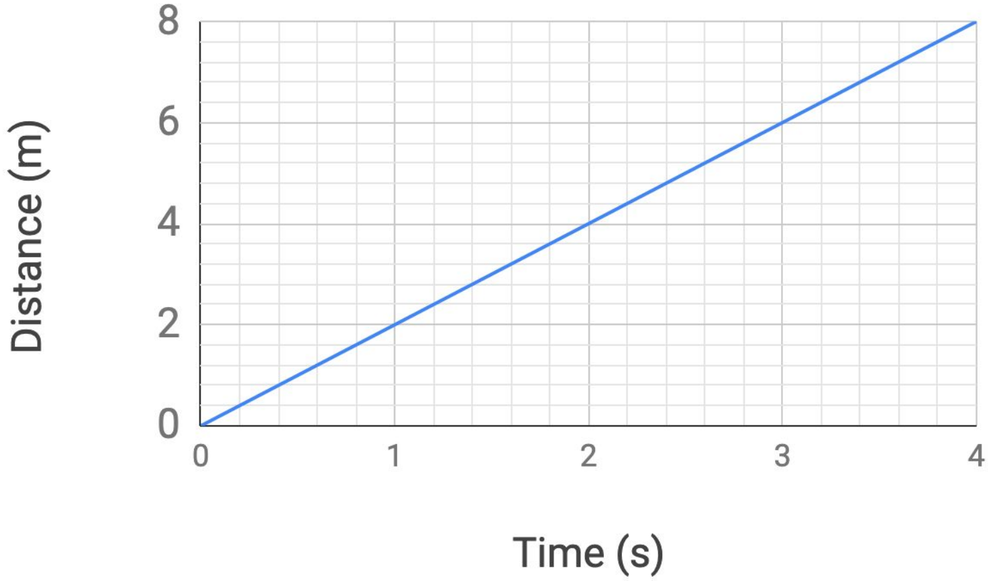
Distance = 100 - 25 = **75** m

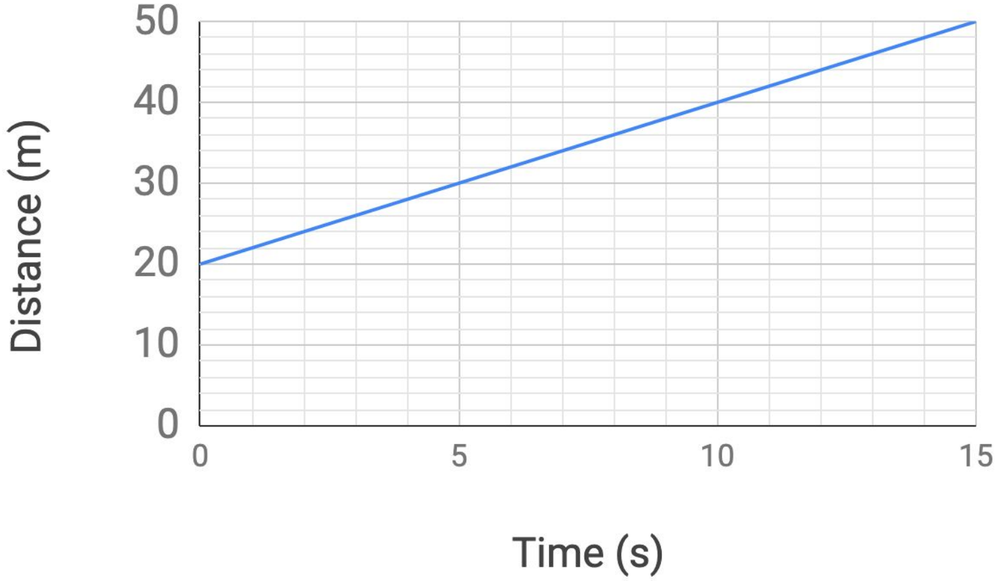
Time = 50 - 10 = **40** s

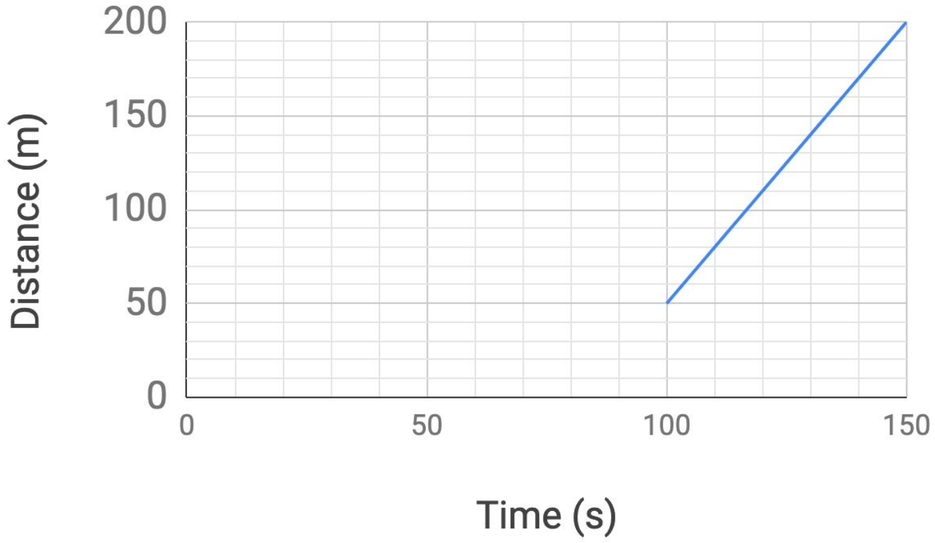
Speed = Distance ÷ time

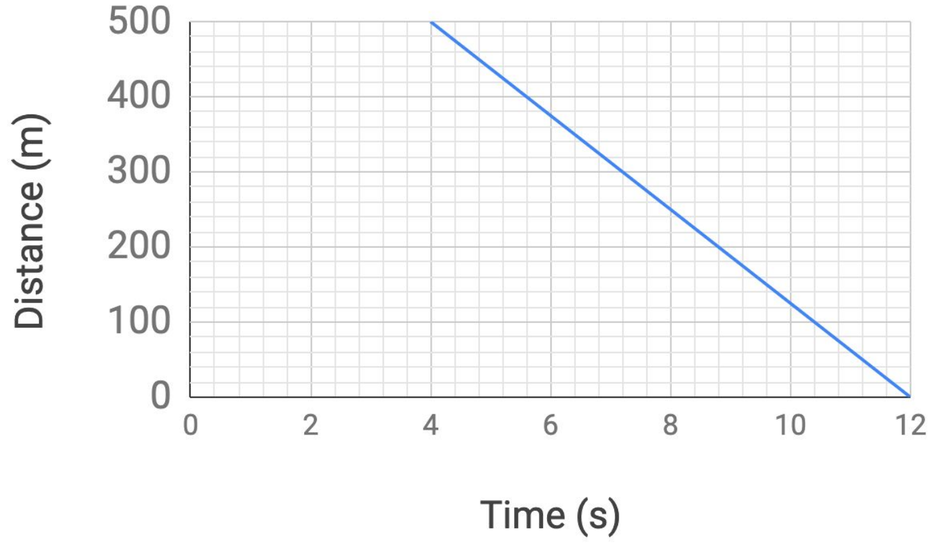
Speed = **75** ÷ **40**

Speed = 1.875 m/s

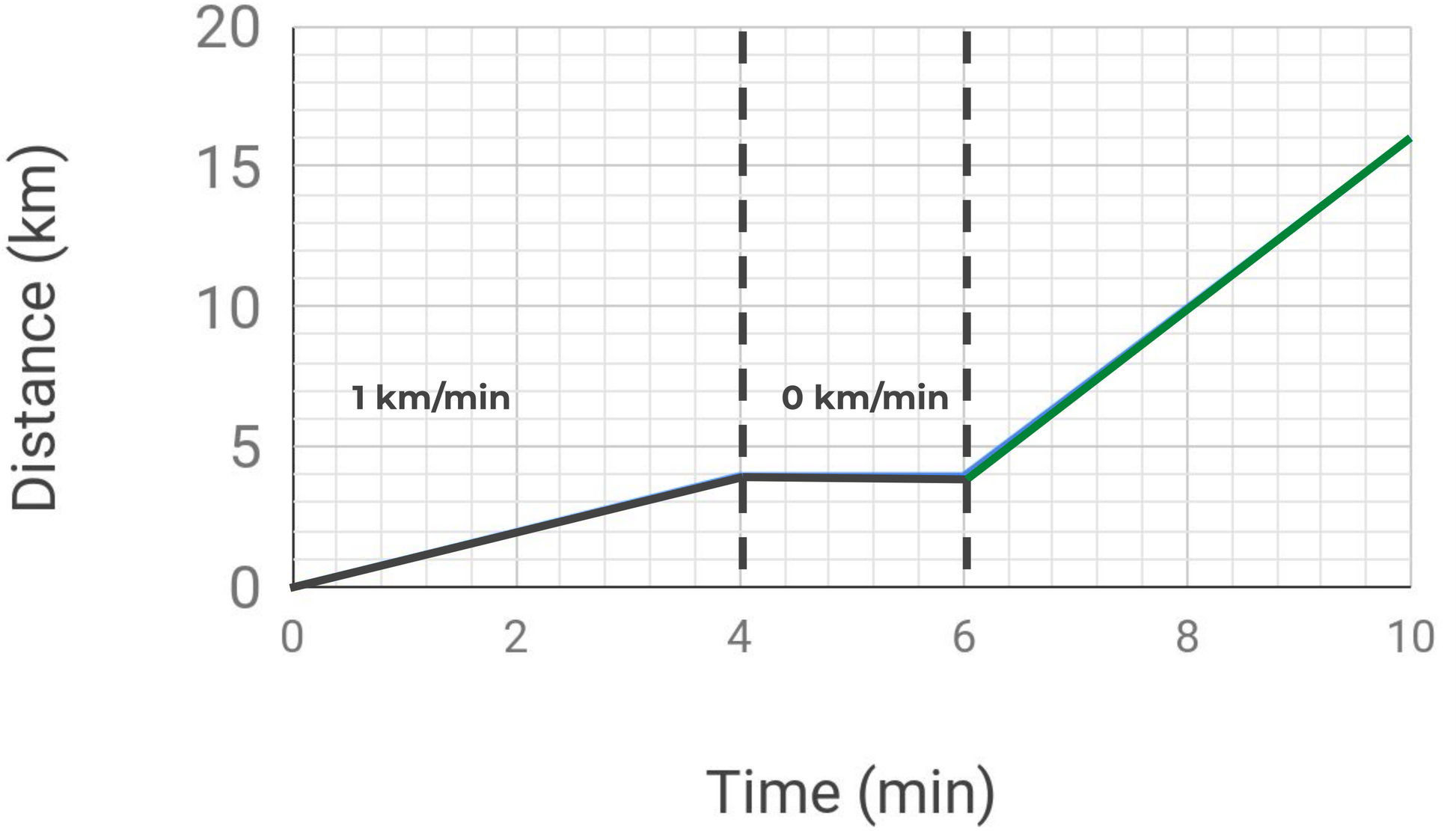

Distance (m)
0
2
4
6
8
0
1
2
3
4
Time (s)

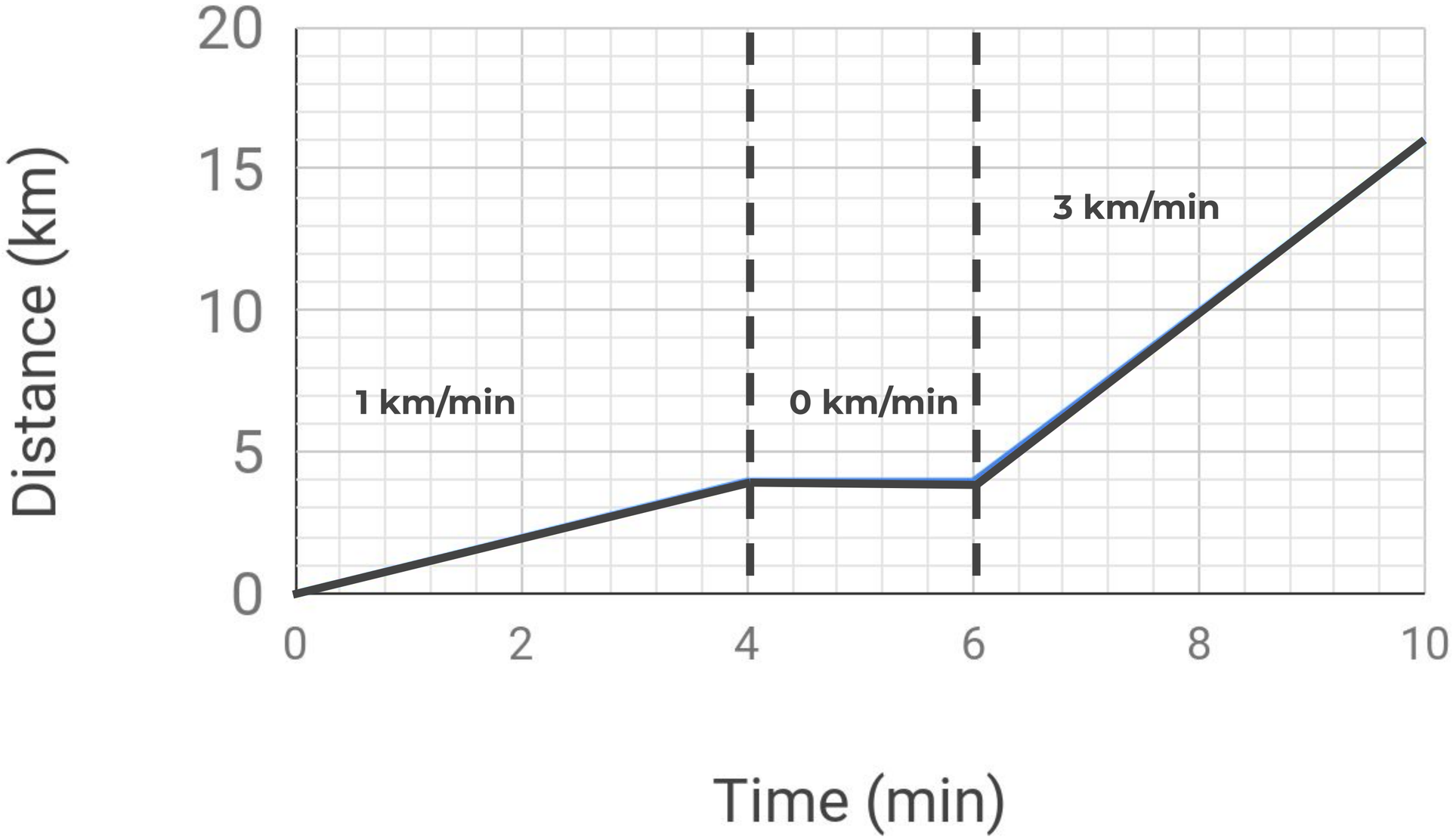

Distance (m)
0
10
20
30
40
50
0
5
10
15
Time (s)


Distance (m)
0
50
100
150
200
0
50
100
150
Time (s)


Distance (m)
0
100
200
300
400
500
0
2
4
6
8
10
12
Time (s)

Distance = **4** km
Time = **4** min
Speed = Distance ÷ time
Speed = **4** ÷ **4**
Speed = 1 km/min
Distance (km)
0
5
10
15
20
0
2
4
6
8
10
Time (min)


Distance (km)
20
15
10
5
0
1 km/min
0 km/min
0
2
4
6
8
10
Time (min)



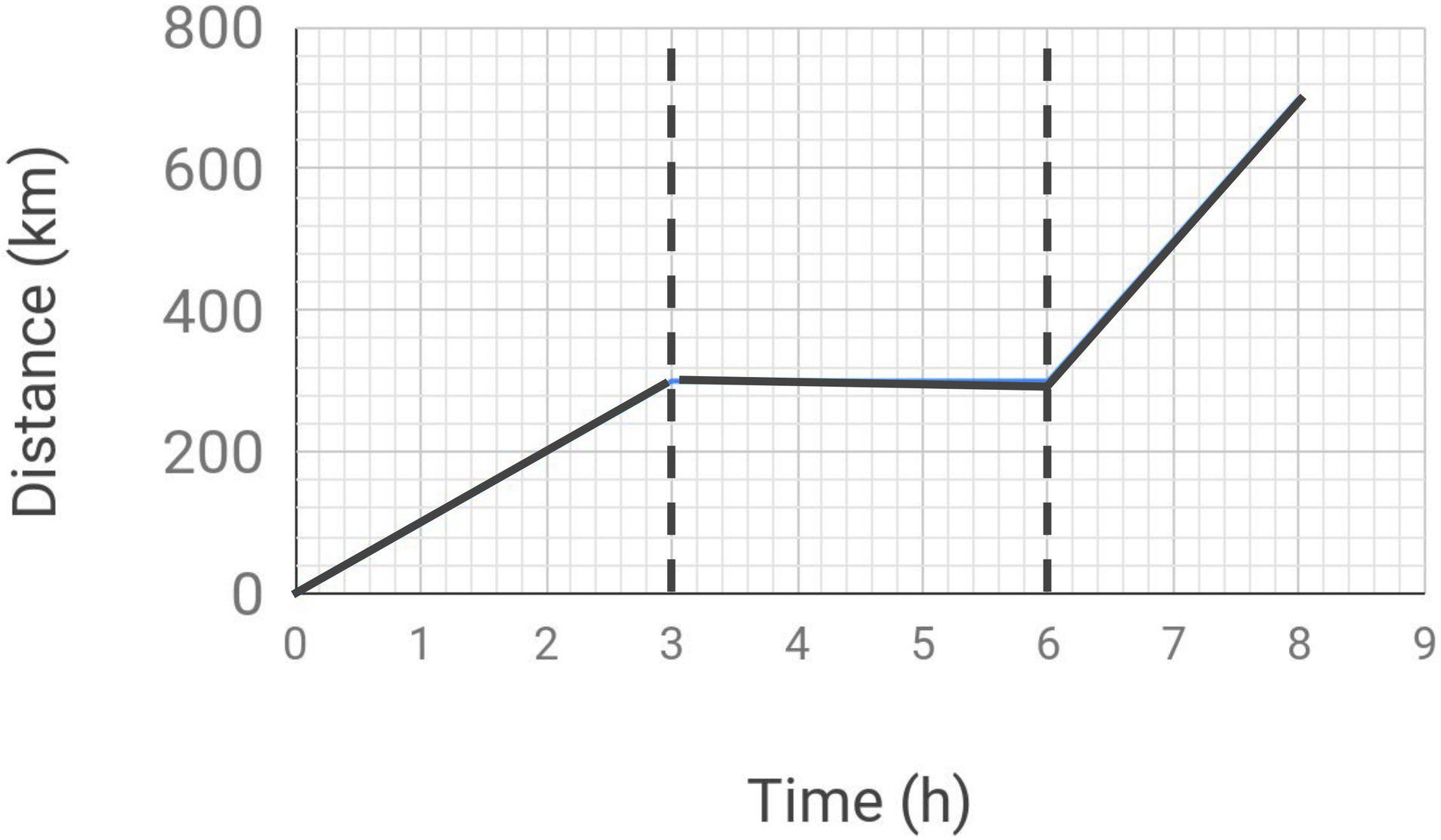
Distance = 16 - 4= **12** km

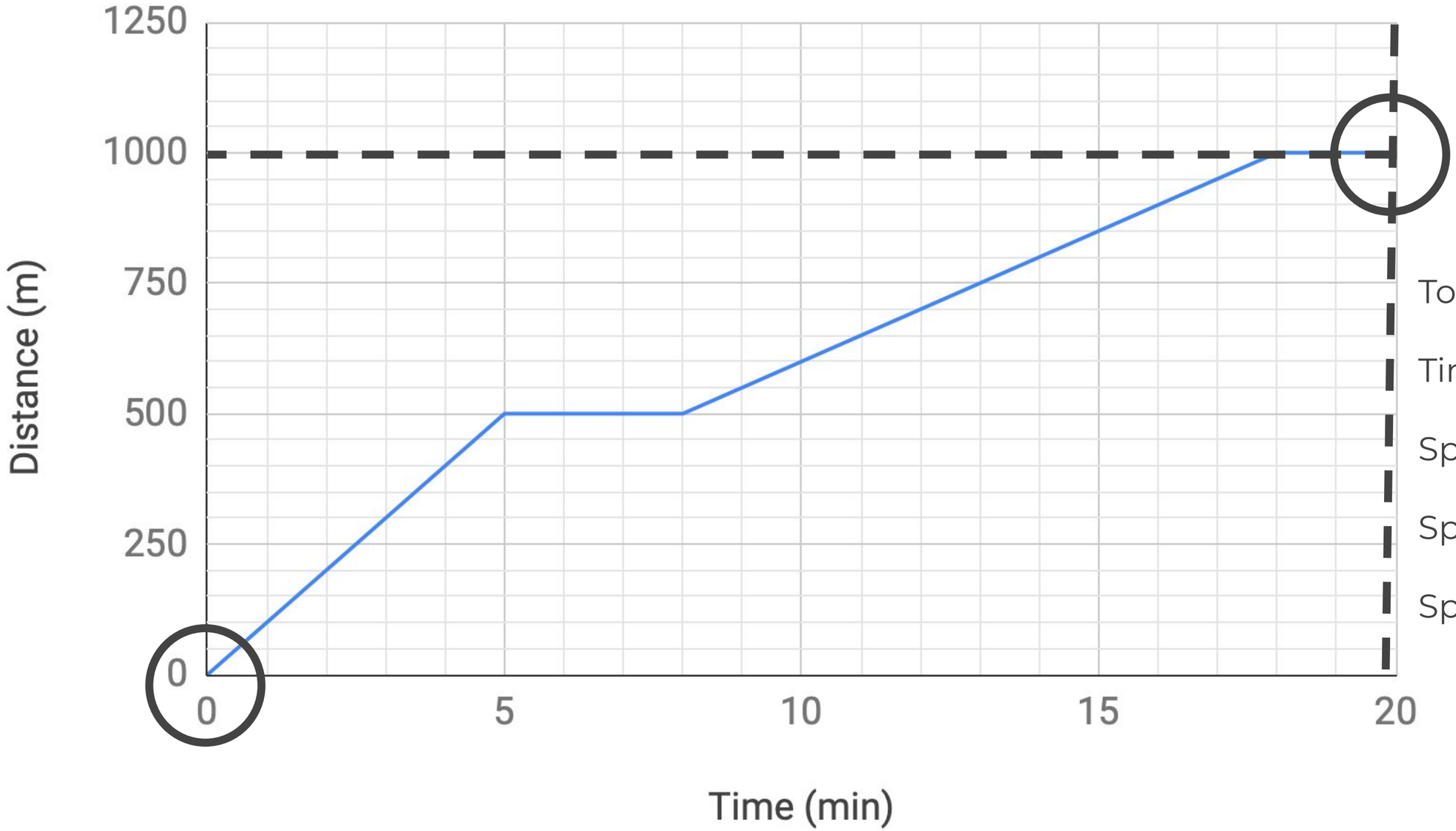
Time = 10 - 6 = **4** min

Speed = Distance ÷ time

Speed = **12** ÷ **4**

Speed = 3 km/min


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



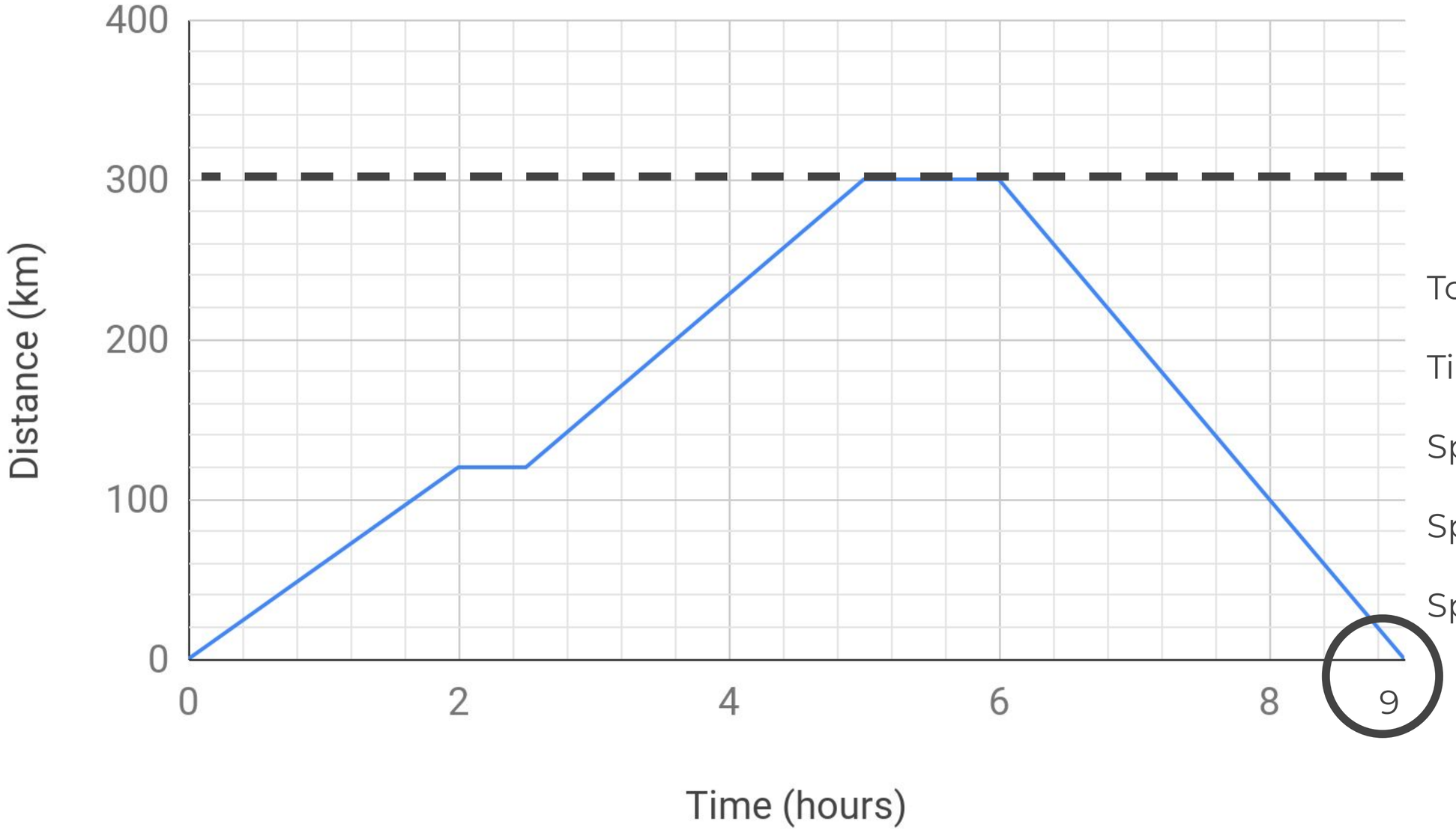
Total Distance = **1000** m

Time = **20** min

Speed = Distance ÷ time

Speed = **1000** ÷ **20**

Speed = 50 m/min



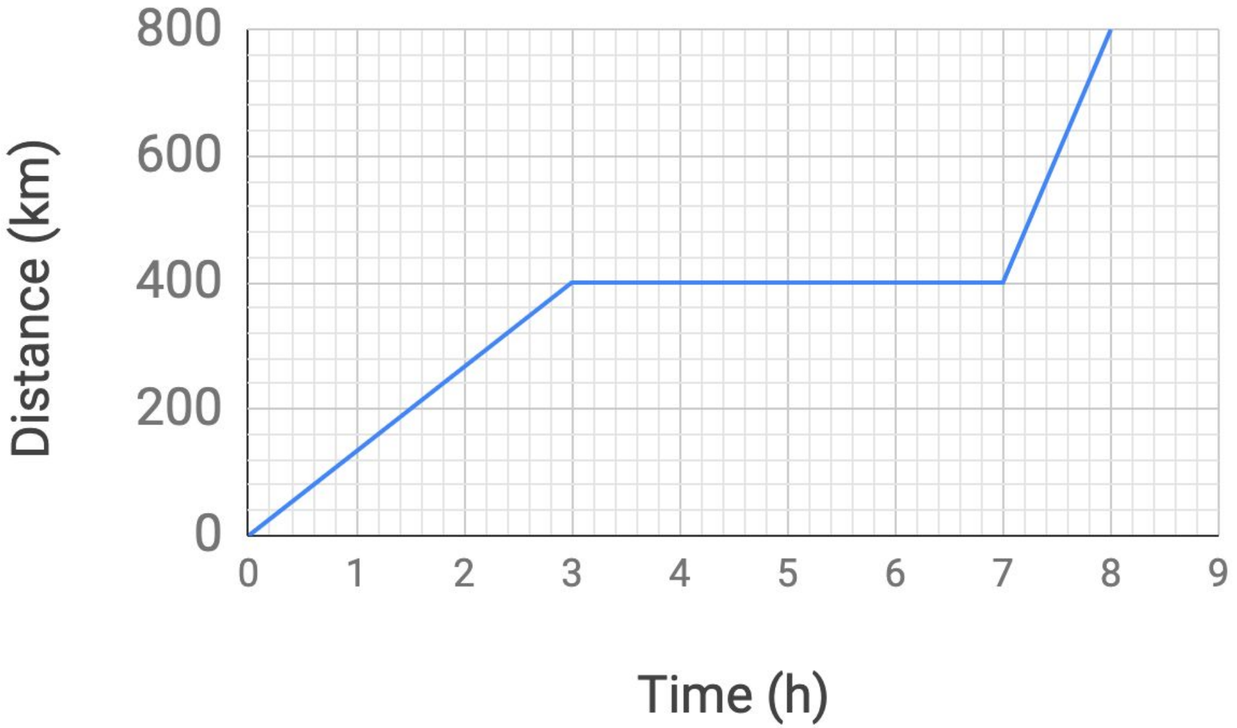
Total Distance = **600** km

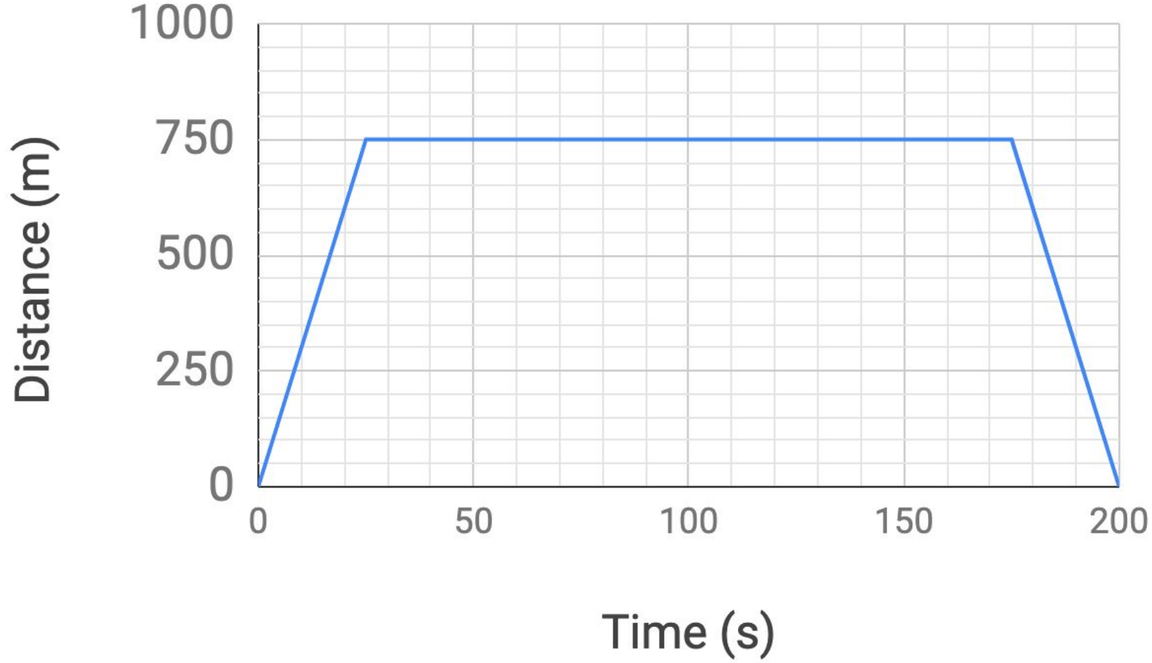
Time = **9** hours

Speed = Distance ÷ time

Speed = **600** ÷ **9**

Speed = 66.7 km/h


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


Distance (m)
1000
750
500
250
0
0
50
100
150
200
Time (s)