



SCAN ME

Speed-Time Graphs

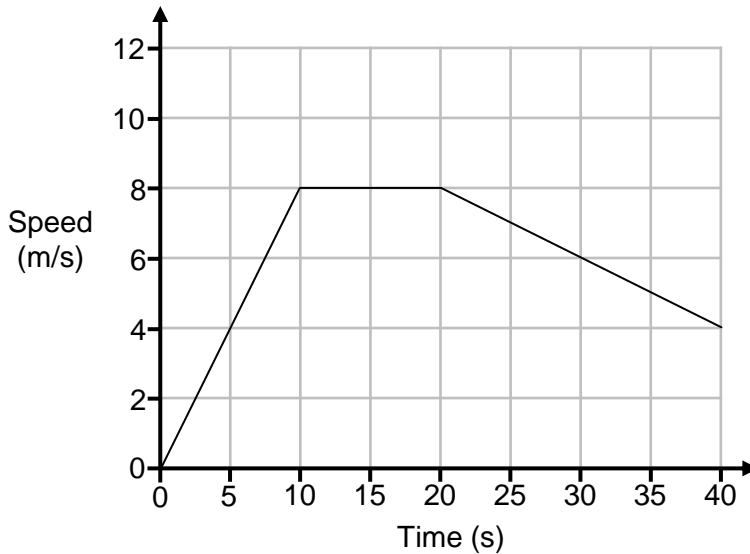


SCAN ME

REVISE THIS TOPIC

CHECK YOUR ANSWERS

1 Here is a speed-time graph for a 40 second journey.



1 (a) Work out the acceleration during the first 10 seconds. State the units of your answer.

[2 marks]

Answer _____

1 (b) Work out the total distance travelled.

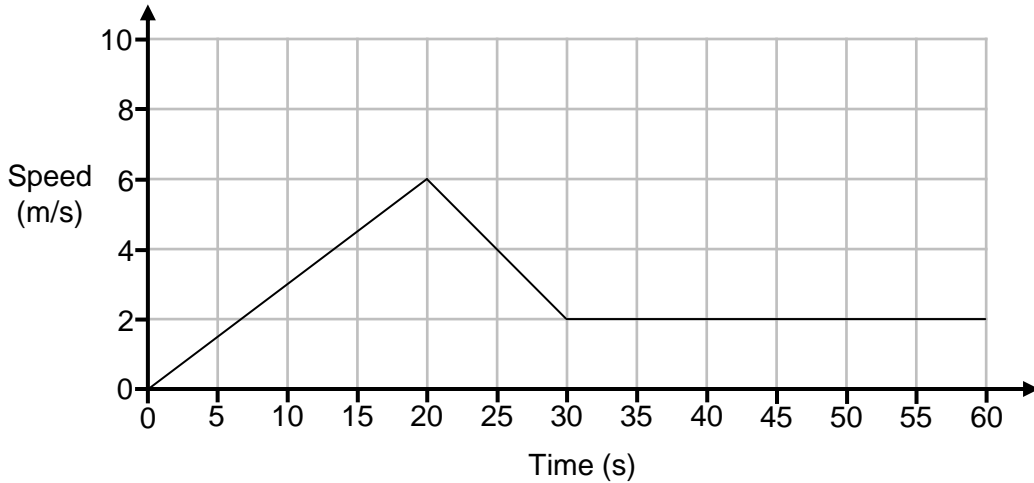
[3 marks]

Answer _____ m

5



2 Here is a speed-time graph for a 1 minute journey.



2 (a) Write down the acceleration in the second half of the journey. [1 mark]

Answer _____ m/s^2

2 (b) Work out the acceleration during the first 20 seconds. [1 mark]

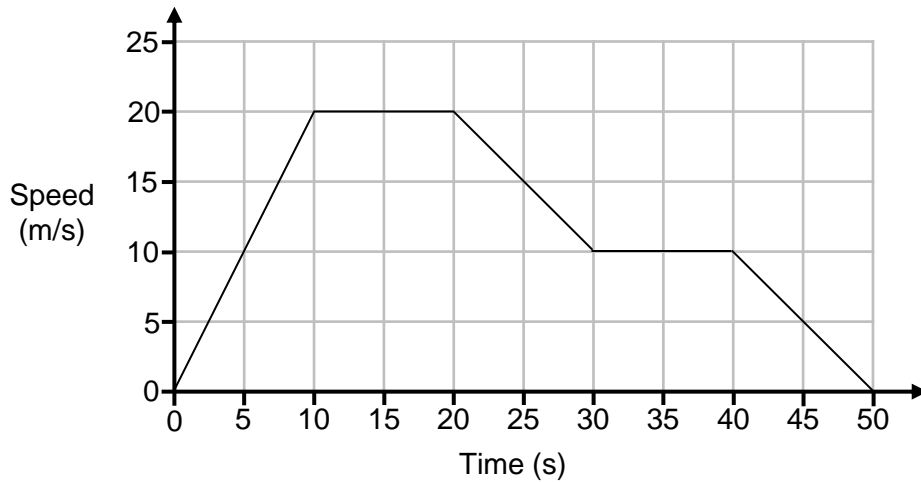
Answer _____ m/s^2

2 (c) Work out the total distance travelled. [3 marks]

Answer _____ m



3 Here is a speed-time graph for a 50 second journey.



Negative

Zero

Positive

Decreasing

Increasing

Use words from the box above to complete each of the statements below.
You may use a word more than once.

[5 marks]

Between 0 and 10 seconds the speed is _____ and _____

Between 0 and 10 seconds the acceleration is _____

Between 10 and 20 seconds the acceleration is _____

Between 20 and 30 seconds the acceleration is _____

Between 20 and 30 seconds the speed is _____ and _____

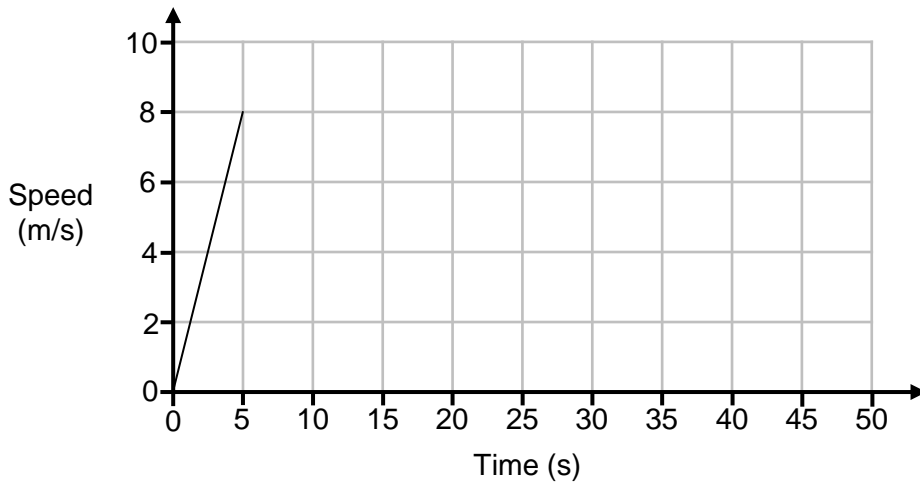


10

Turn over ►



4 Here is part of a speed-time graph for an athlete in a 400 metre race.



4 (a) Work out the acceleration of the athlete in the first 5 seconds. [1 mark]

Answer _____ m/s²

4 (b) After the first 5 seconds the athlete runs at a constant speed to the end of the race.

Work out the total time taken for the athlete to complete the 400 metre race.

[3 marks]

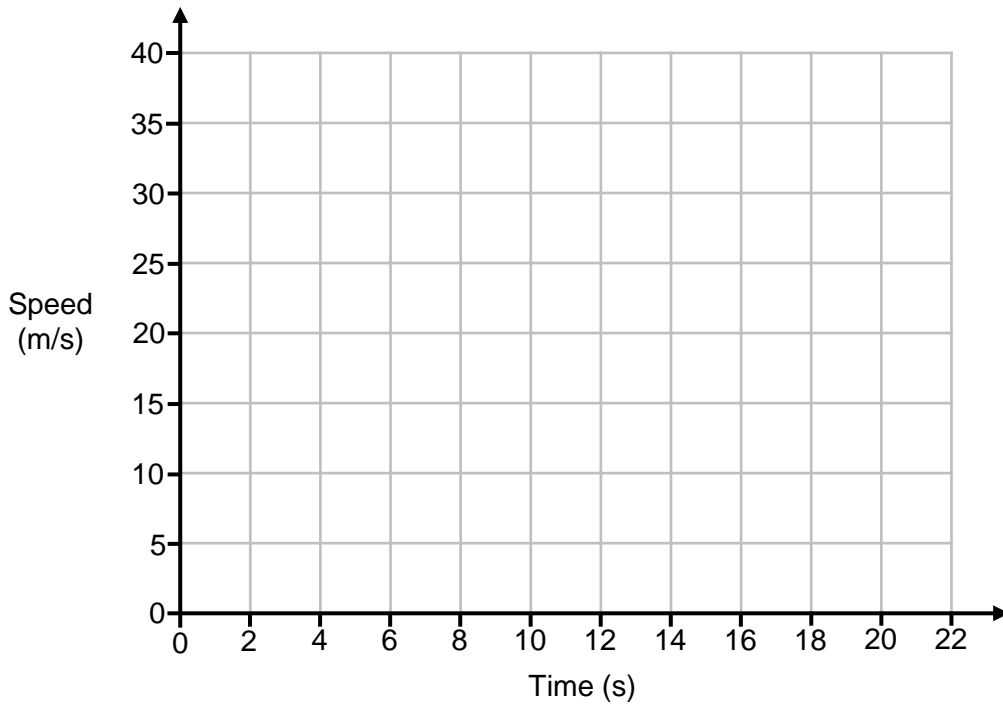
Answer _____ seconds





5 A car accelerates from rest with a constant acceleration 5 m/s^2 for 6 seconds.
The car then travels at a constant speed for a further 8 seconds before decelerating at 7.5 m/s^2 until it comes to rest.

5 (a) Draw a speed-time graph for the car onto the grid below. [3 marks]



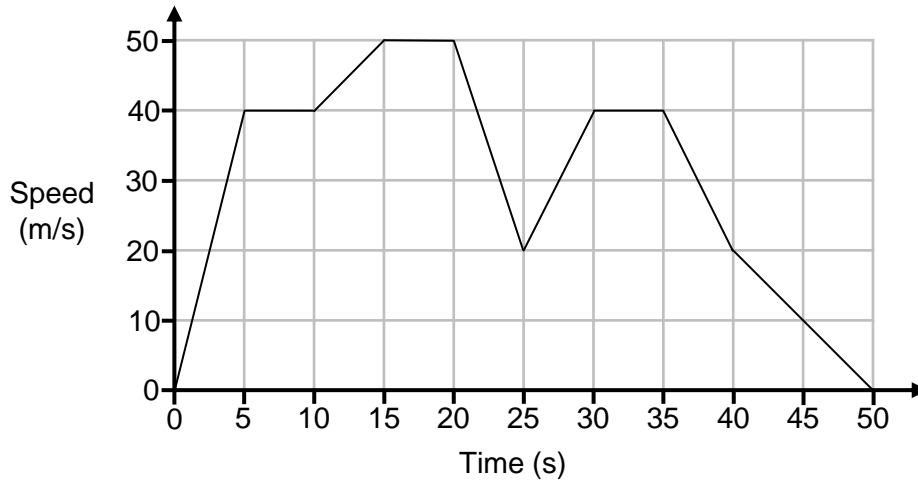
5 (b) Work out the total distance travelled by the car. [2 marks]

Answer _____ m

Turn over ►



6 Here is a speed-time graph for a 50 second journey.



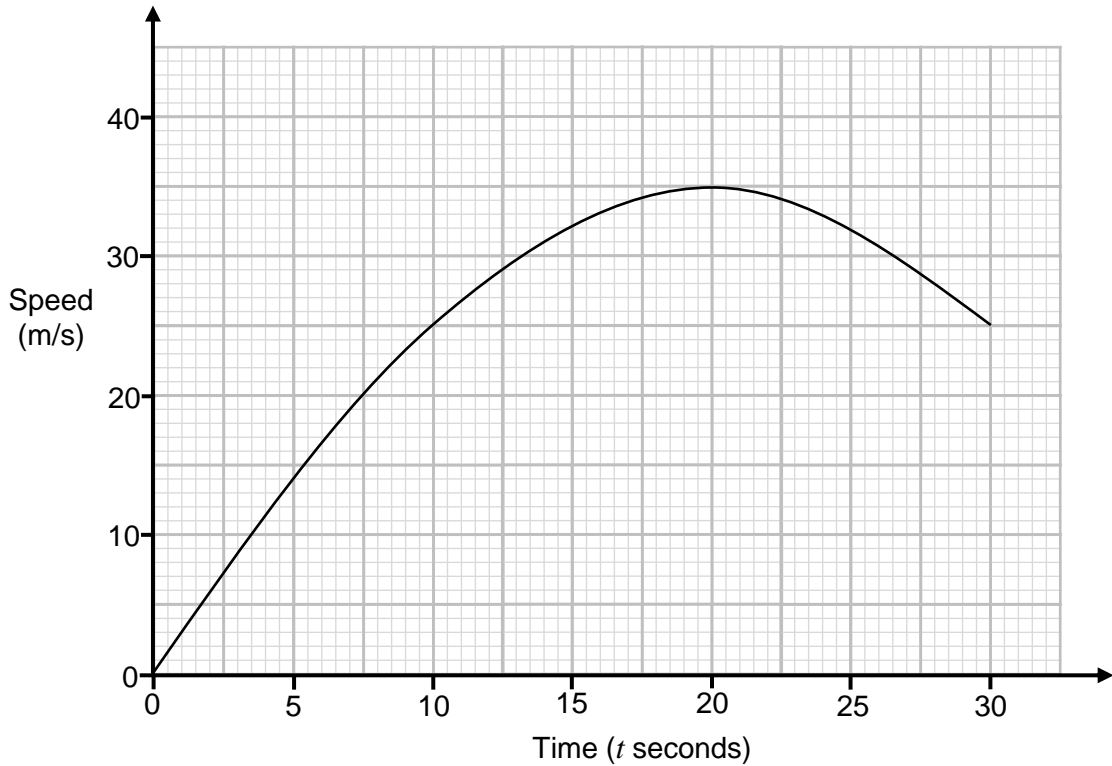
Tick the correct box for each statement below

[4 marks]

	True	False
The acceleration is greatest between 15 and 20 seconds.	<input type="checkbox"/>	<input type="checkbox"/>
The acceleration between 15 and 20 seconds is the same as the acceleration between 30 and 35 seconds.	<input type="checkbox"/>	<input type="checkbox"/>
The acceleration between 25 and 30 seconds is the same as the acceleration between 35 and 40 seconds.	<input type="checkbox"/>	<input type="checkbox"/>
The distance travelled in the first 5 seconds is the same as the distance travelled in the last 10 seconds.	<input type="checkbox"/>	<input type="checkbox"/>



7 Here is a speed-time graph for a 30 second journey.



7 (a) Work out an estimate for the acceleration when $t = 15$ seconds. [2 marks]

Answer _____ m/s²

7 (b) Work out an estimate for the distance travelled in the first 20 seconds. [3 marks]

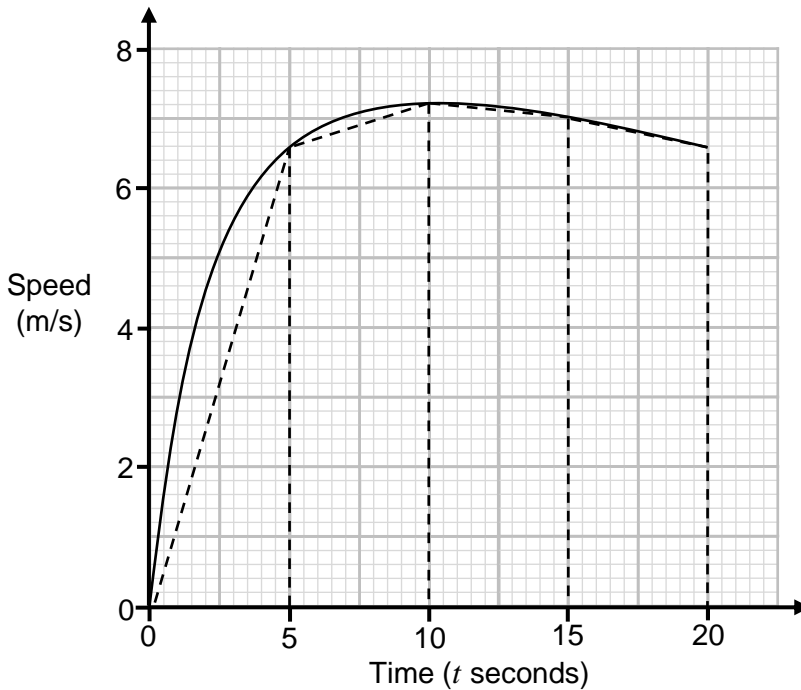
Answer _____ m

$\frac{\quad}{8}$

Turn over ►



8 Here is a speed-time graph for an athlete during a race.



- 8 (a) The athlete finishes the race in 20 seconds. Paul uses a triangle and three trapeziums to estimate the distance of the race. Work out Paul's estimate for the distance of the race. **[4 marks]**

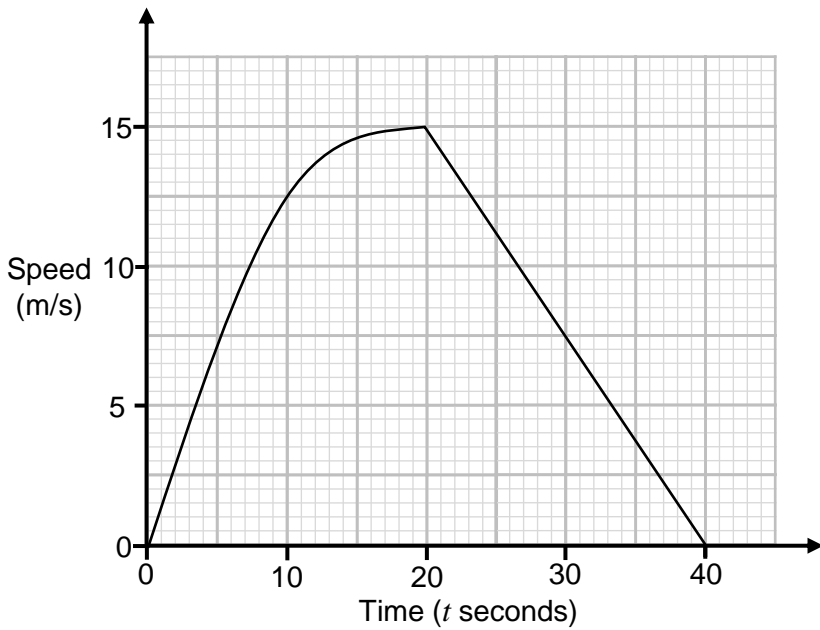
Answer _____ m

- 8 (b) Is Paul's estimate an overestimate or underestimate for the real distance of the race? **[1 mark]**

Answer _____



9 Here is a speed-time graph for a 40 second journey.



9 (a) Show clearly that the distance travelled in the first half of the journey is greater than the distance travelled in the second half of the journey. [2 marks]

9 (b) Work out the average acceleration for the first half of the journey. [2 marks]

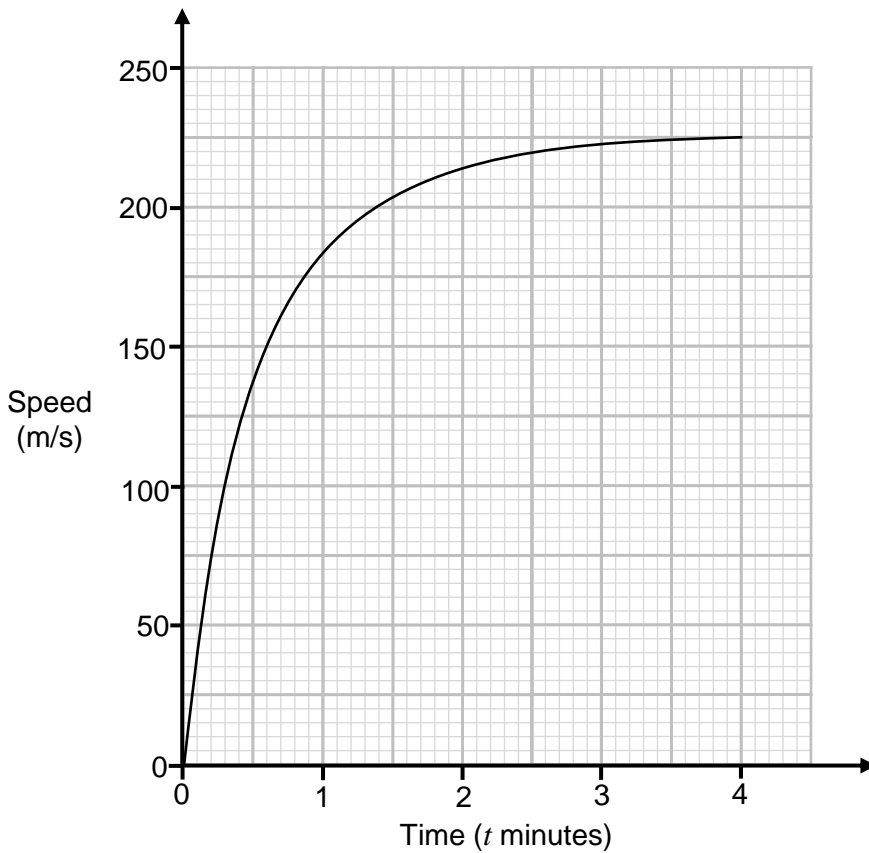
Answer _____ m/s²



Turn over ►



10 Here is a speed-time graph for the first 4 minutes of an aeroplane's flight.



10 (a) Work out the average acceleration for the first 4 minutes.
Give your answer in m/s^2

[2 marks]

Answer _____ m/s^2

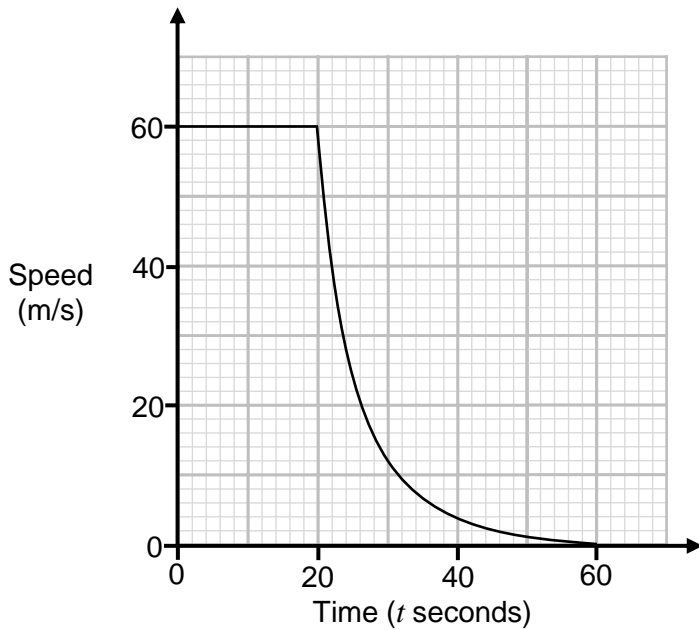
10 (b) How many seconds into the flight was the acceleration of the aeroplane equal to the average acceleration for the first 4 minutes.

[1 mark]

Answer _____ seconds



11 Here is a speed-time graph for a train as it arrives to a station.



11 (a) Write down the acceleration of the train in the first 20 seconds. [1 mark]

Answer _____ m/s²

11 (b) Work out an estimate for the distance the train travels between 0 and 60 seconds. [3 marks]

Answer _____ m

11 (c) Is your answer to part (b) an overestimate or underestimate for the real distance that the train travels? [1 mark]

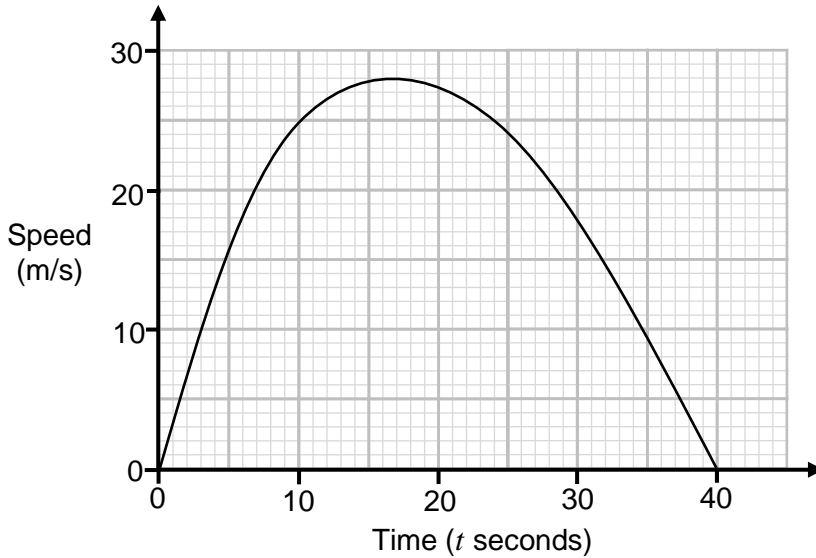
Answer _____

$\frac{\quad}{8}$

Turn over ►



12 Here is a speed-time graph for a 40 second car journey.



12 (a) After how many second was the acceleration zero? [1 mark]

Answer _____ seconds

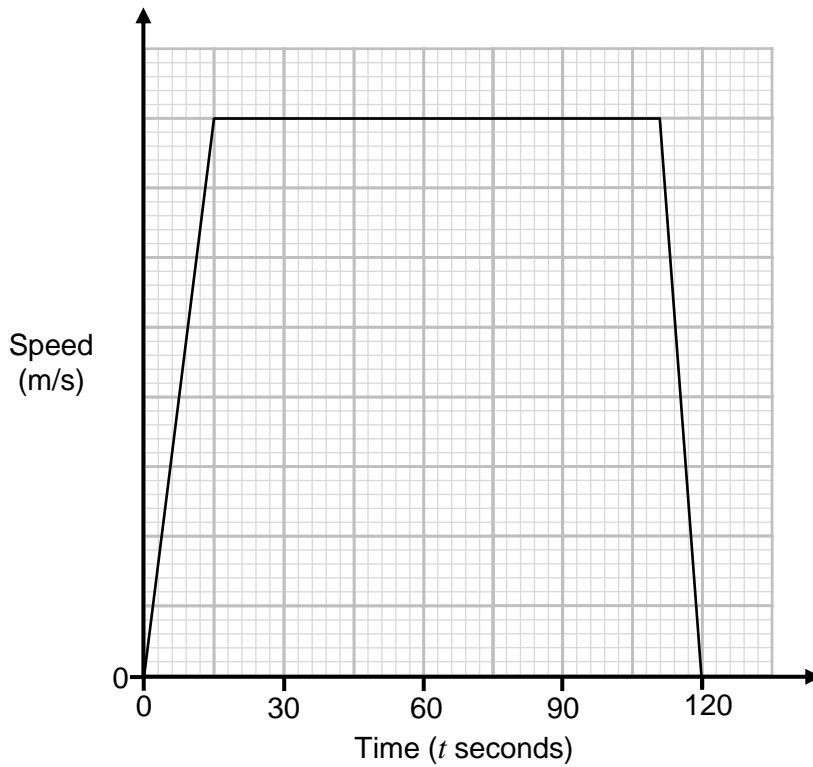
12 (b) The car is travelling on a road with a speed limit of 90 km/h

Work out percentage of the 40 second journey that the car was above the speed limit. [4 marks]

Answer _____ %



13 Here is a speed-time graph for a super car during a 2 minute journey.



The total distance travelled by the super car is 8.64 km

Work out the acceleration of the super car in the first 15 seconds.

[4 marks]

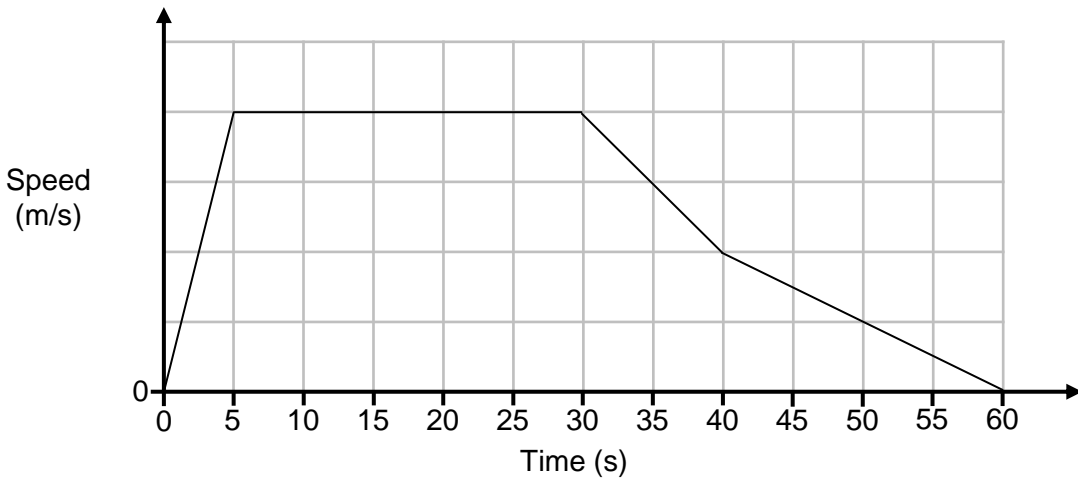
Answer _____ m/s²

$\frac{\quad}{9}$

Turn over ►



14 Here is a speed-time graph for Tommy as he goes from his house to the docks.



14 (a) At what time is Tommy halfway between his house and the docks? [4 marks]

Answer _____ seconds

14 (b) The total distance between Tommy's house and the docks is 320 metres.

Work out the maximum speed that Tommy reaches on his way to the docks.

[3 marks]

Answer _____ m/s

$\frac{\quad}{7}$

