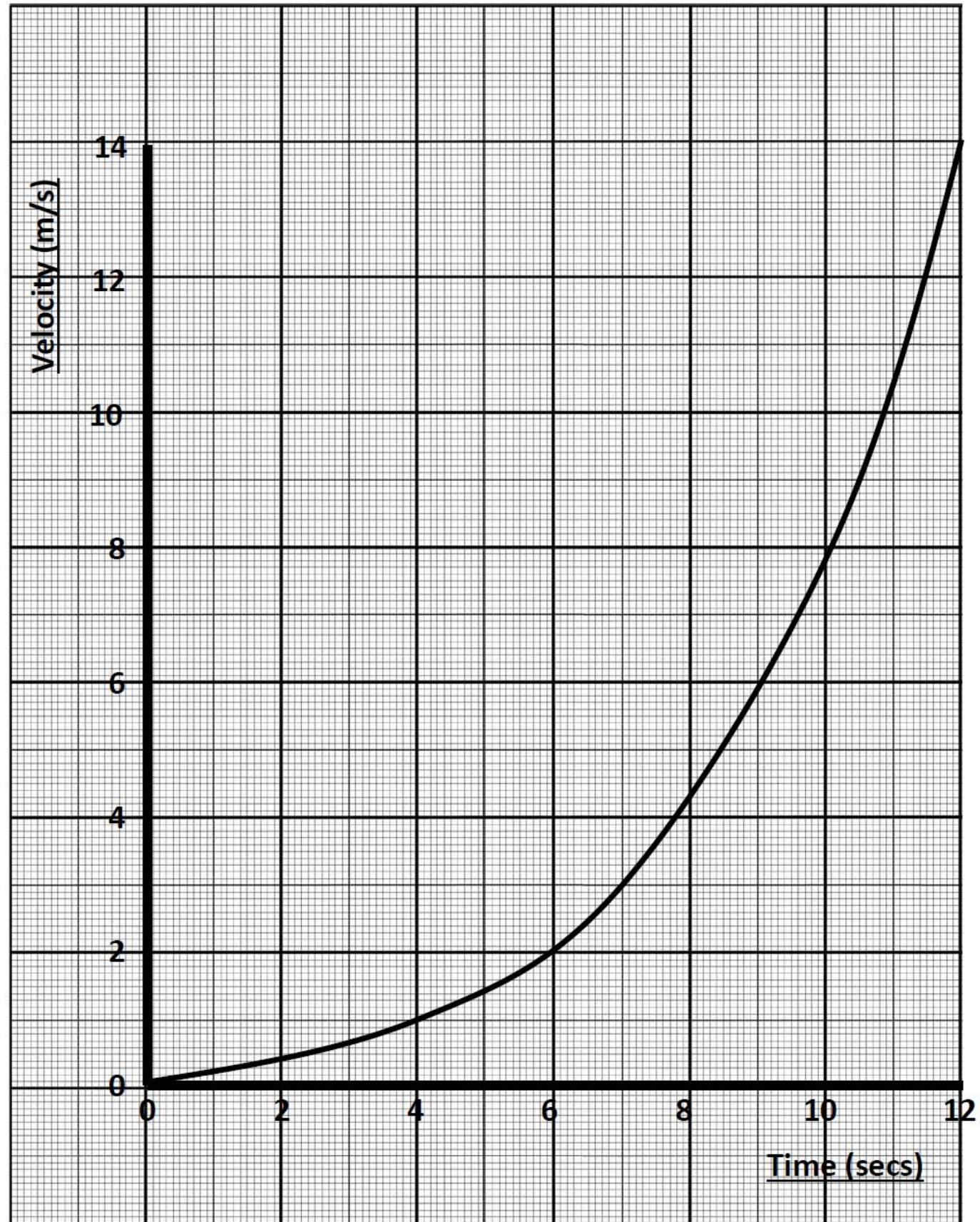


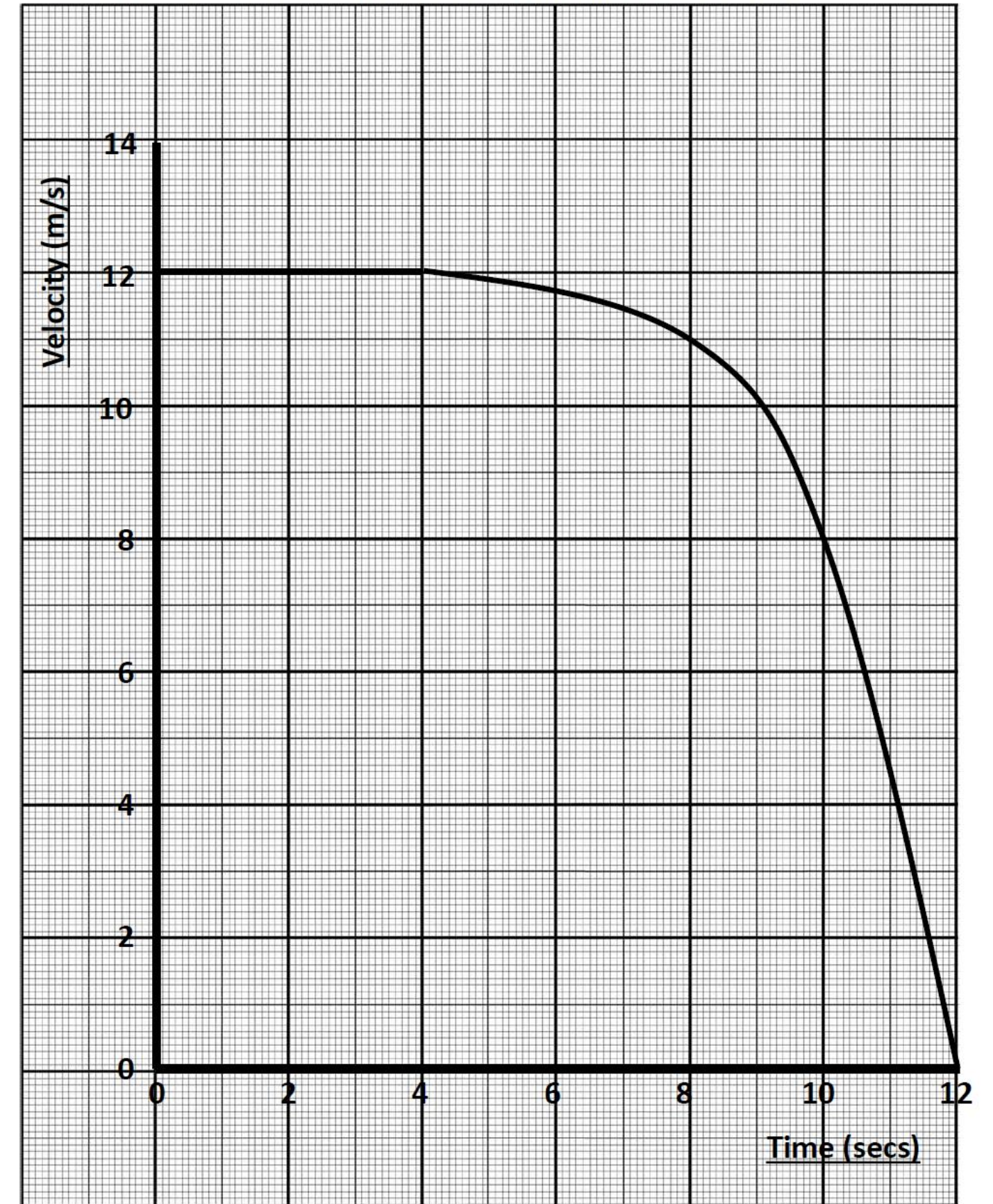
Gradient and Area Under Curves

1. The velocity time graph below shows the first part of a train's journey.



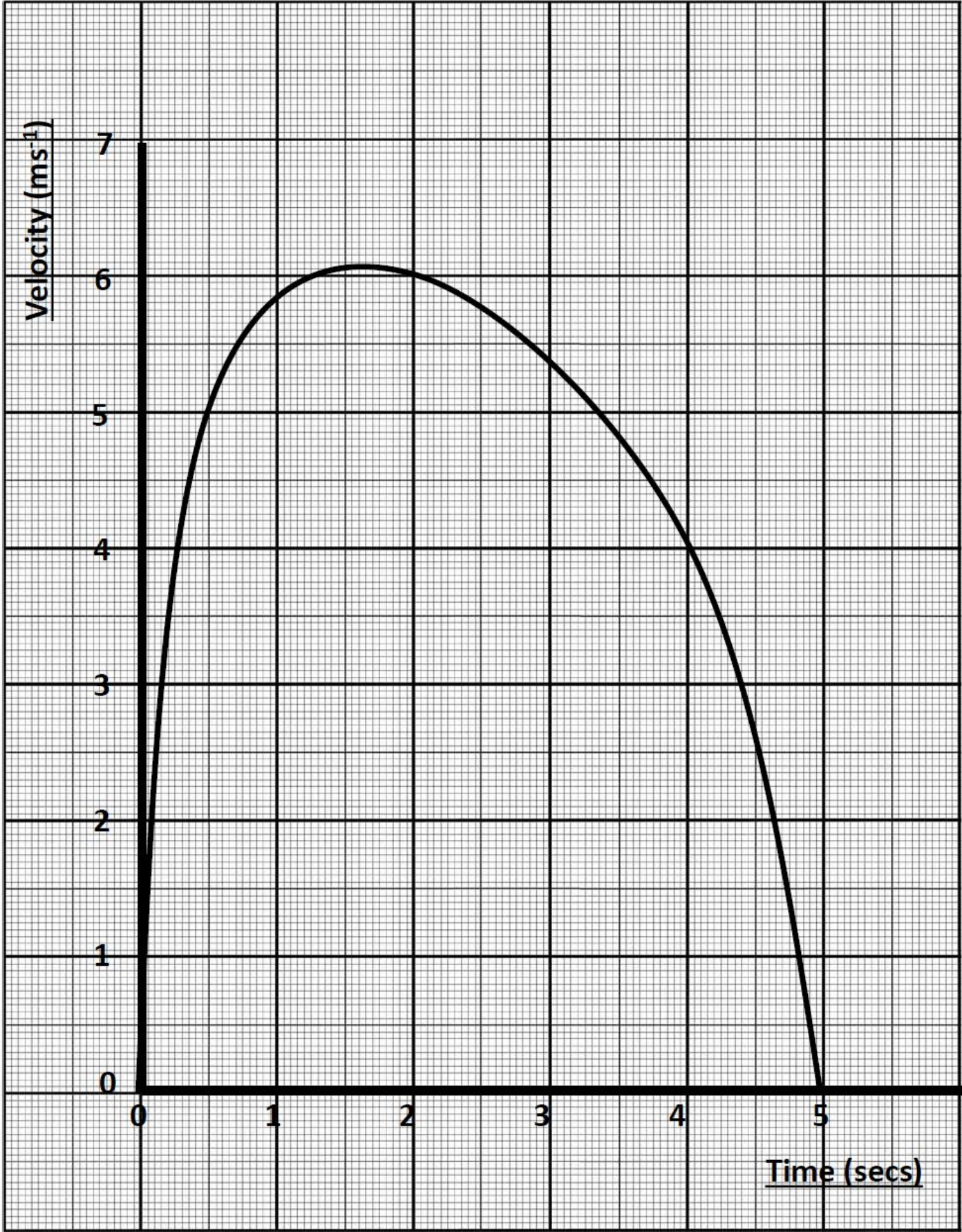
- Calculate the acceleration of the train at time $t = 6$
- Calculate the distance travelled by the train between 2 and 10 seconds. Use 4 strips of equal width.

2. The graph below shows the speed of a car as it approaches a junction.



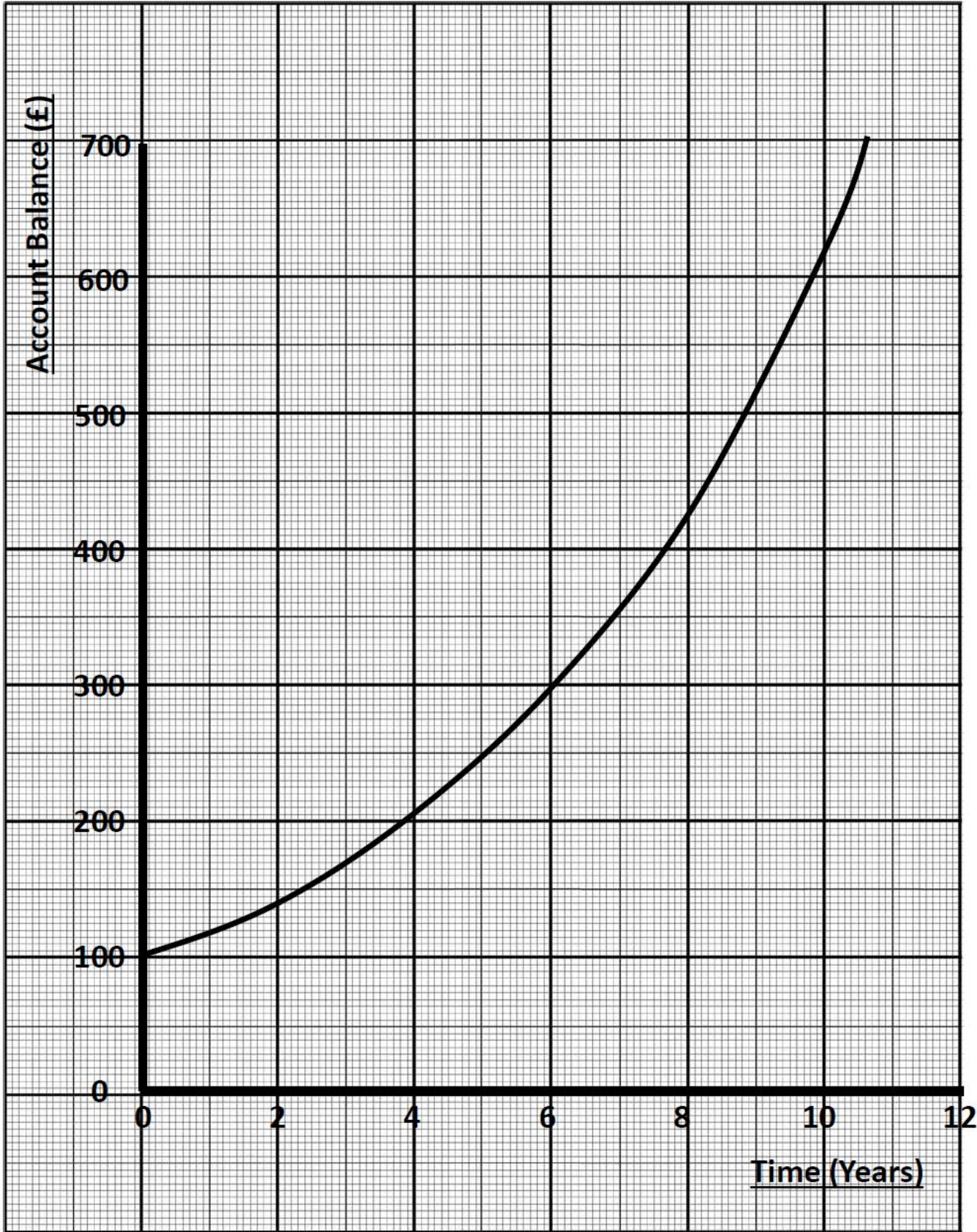
- Describe what is happening between 0 and 4 seconds
- Calculate the car's deceleration at time $t = 8$.
- Calculate the distance travelled by the car between 8 and 12 seconds. Use 4 strips of equal width.

3. The graph below shows the journey of a javelin when thrown.



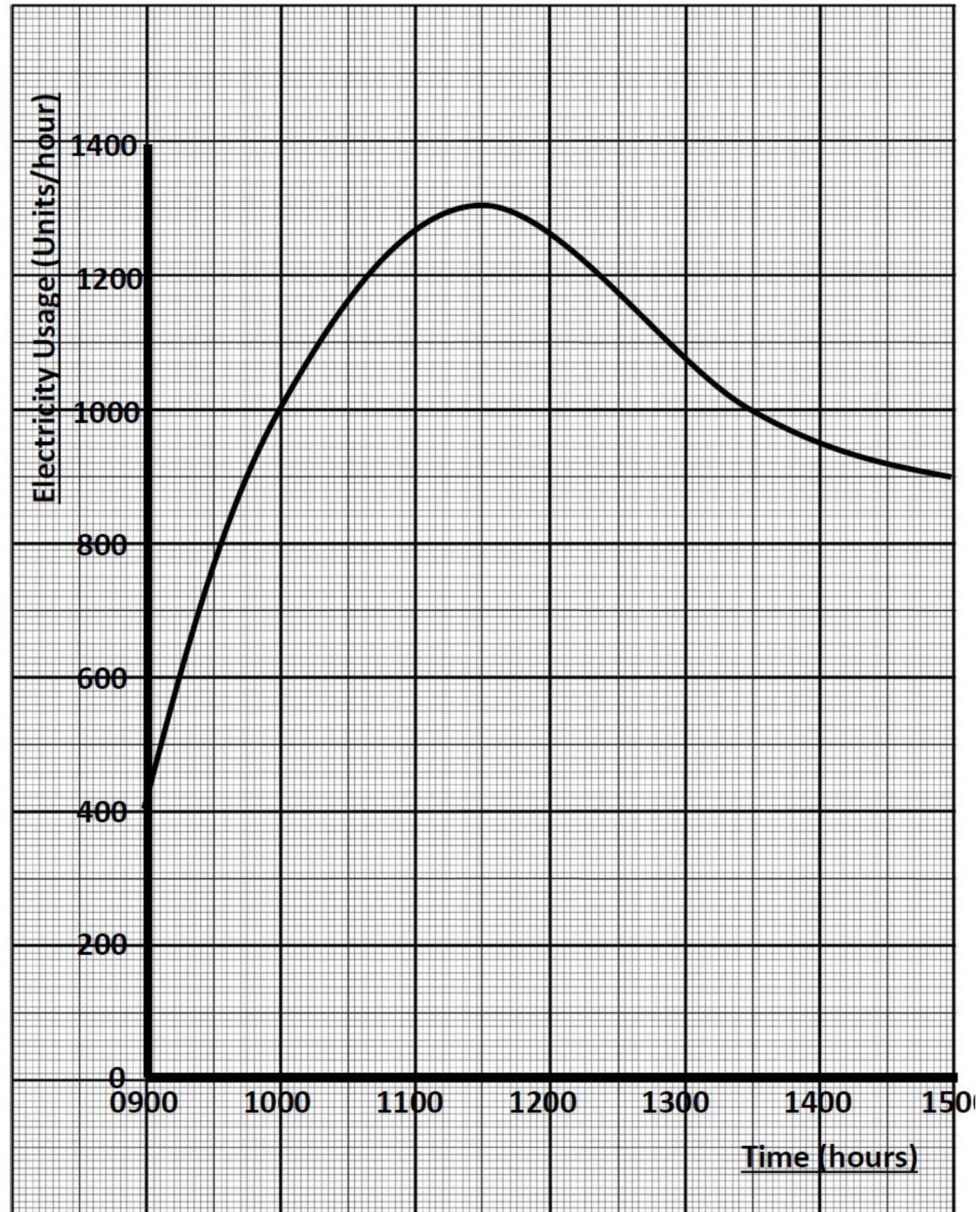
- a) Calculate the acceleration of the javelin at time $t = 4$.
- b) Calculate the distance travelled by the javelin between 2 and 5 seconds.

4. Will gets £100 which he puts in his bank. Each year he puts more money into his account to ensure the total increases by 20% each year. The graph below shows Will's account balance over a 10 year period.



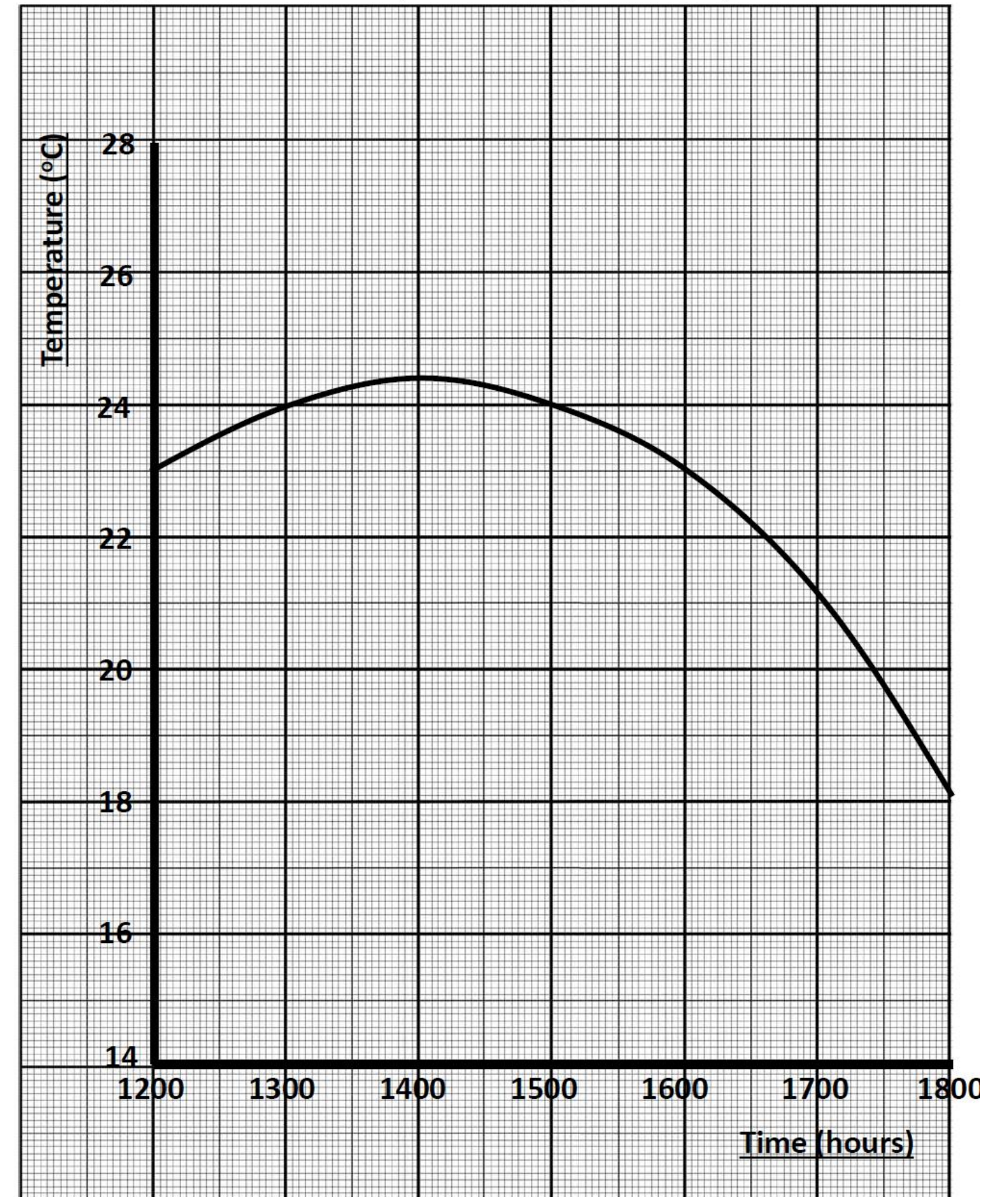
- a) How much money is in Will's account after 7 years?
- b) Calculate the rate of change of Will's balance in year 6. State the units in your answer.

5. The graph below shows the electricity usage by a church hall.



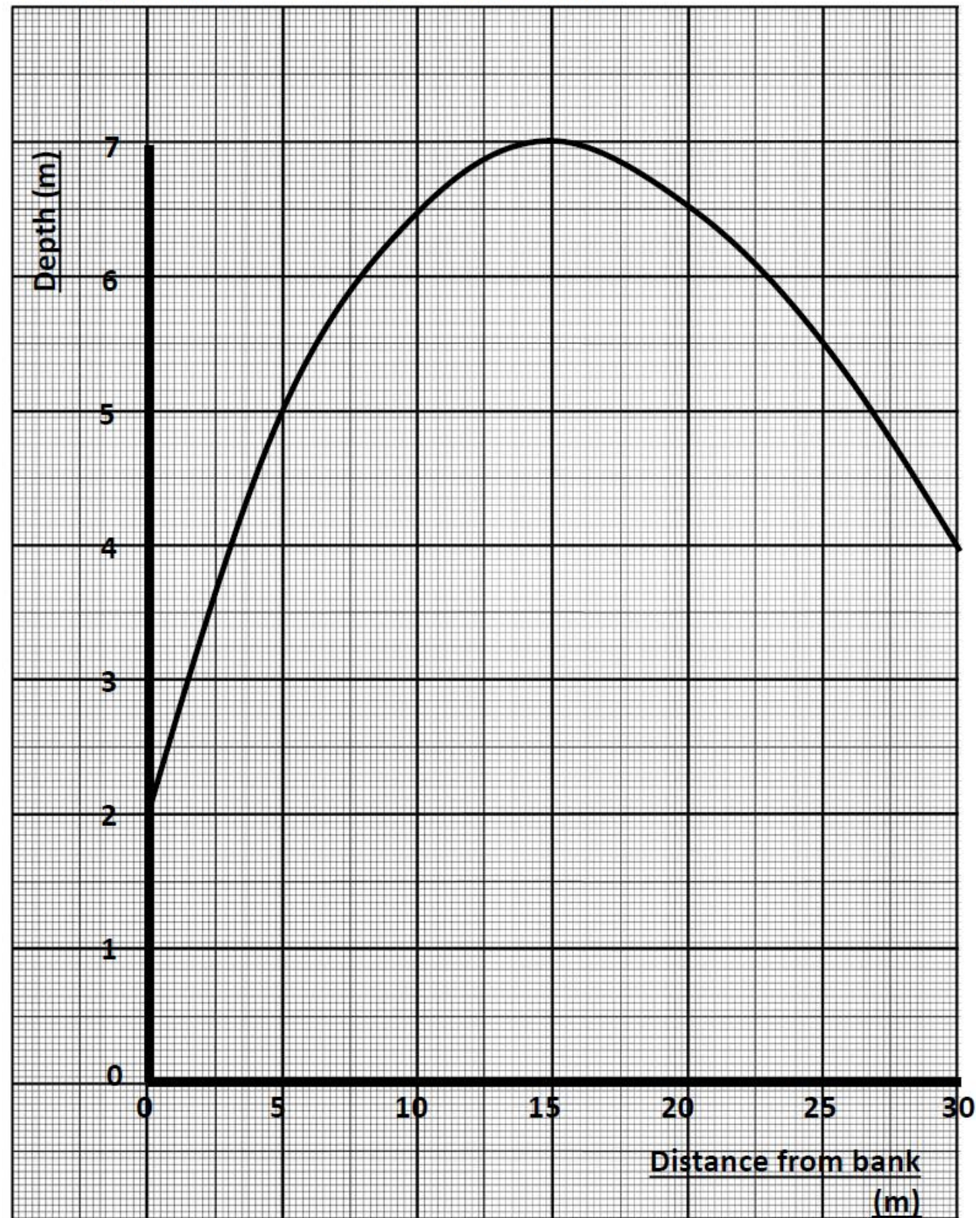
- Calculate the rate of change of the electricity usage at 11:00.
- Calculate the amount of electricity used by the church hall between 10:00 and 12:00. State the units in your answer.

6. The graph below shows the temperature during part of one day in June.



- What is the temperature at 16:00?
- Calculate the gradient at 17:00
- Describe what you have calculated in part b), stating any units.

7. The graph below shows the cross-section of a river.

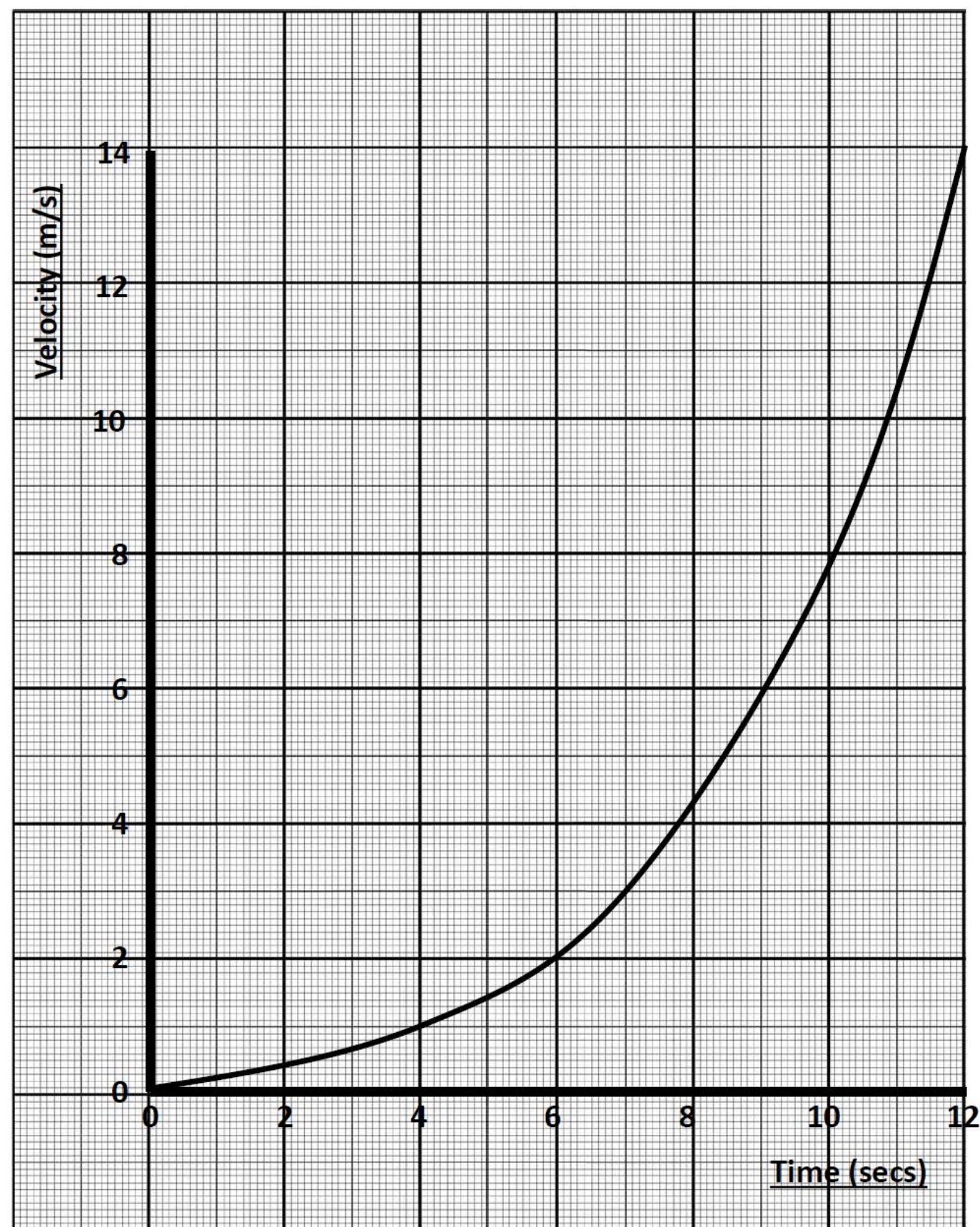


- a) Calculate the rate of change in depth of the river 10m from the bank.
- b) Calculate the area of the cross-section. Use 6 strips of equal widths

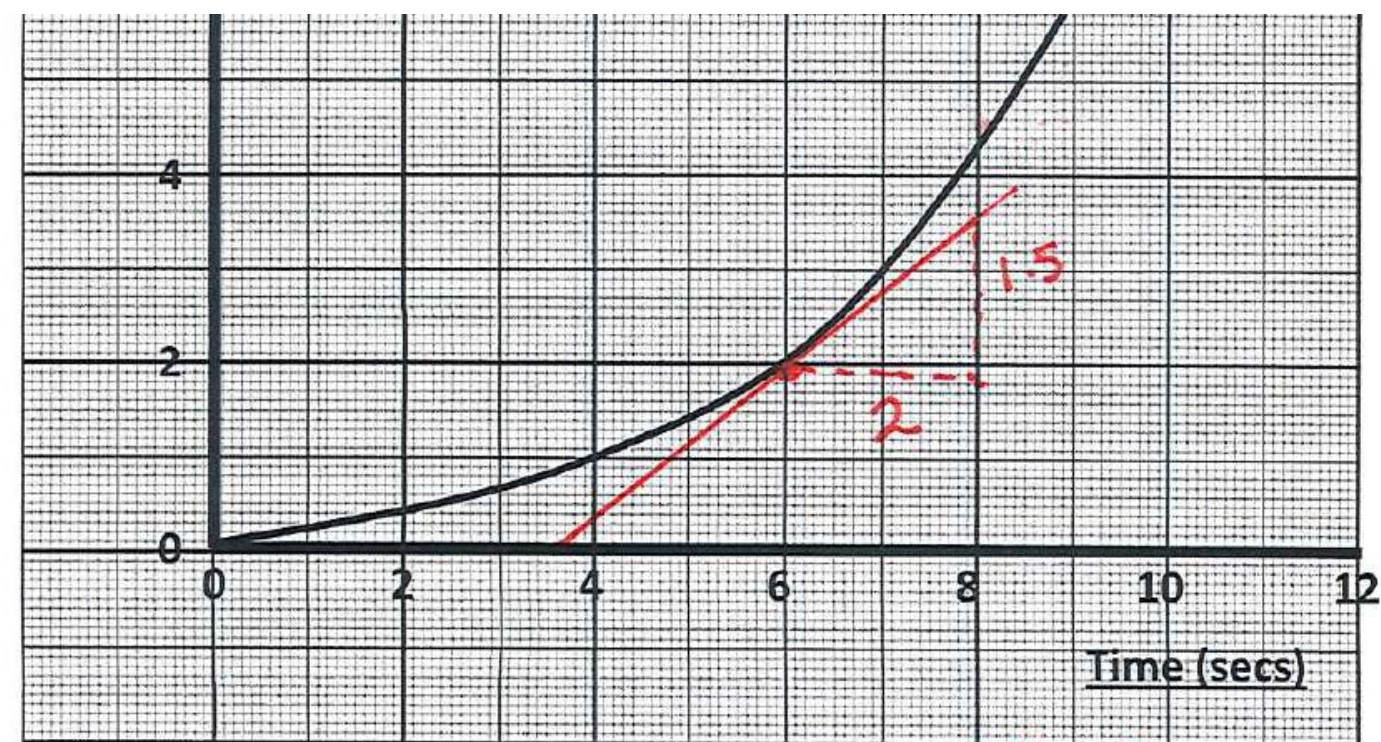
ANSWERS

Gradient and Area Under Curves

1. The velocity time graph below shows the first part of a train's journey.



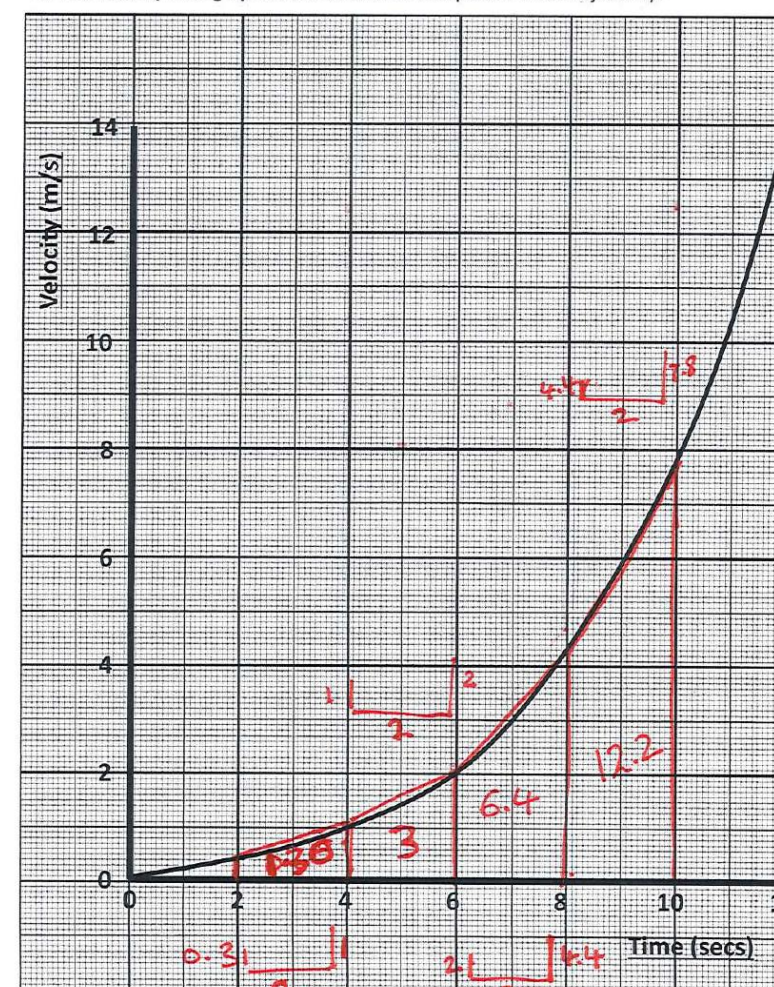
- Calculate the acceleration of the train at time $t = 6$
- Calculate the distance travelled by the train between 2 and 10 seconds. Use 4 strips of equal width.



- Calculate the acceleration of the train at time $t = 6$

$$\frac{1.5}{2} = \frac{3}{4}$$

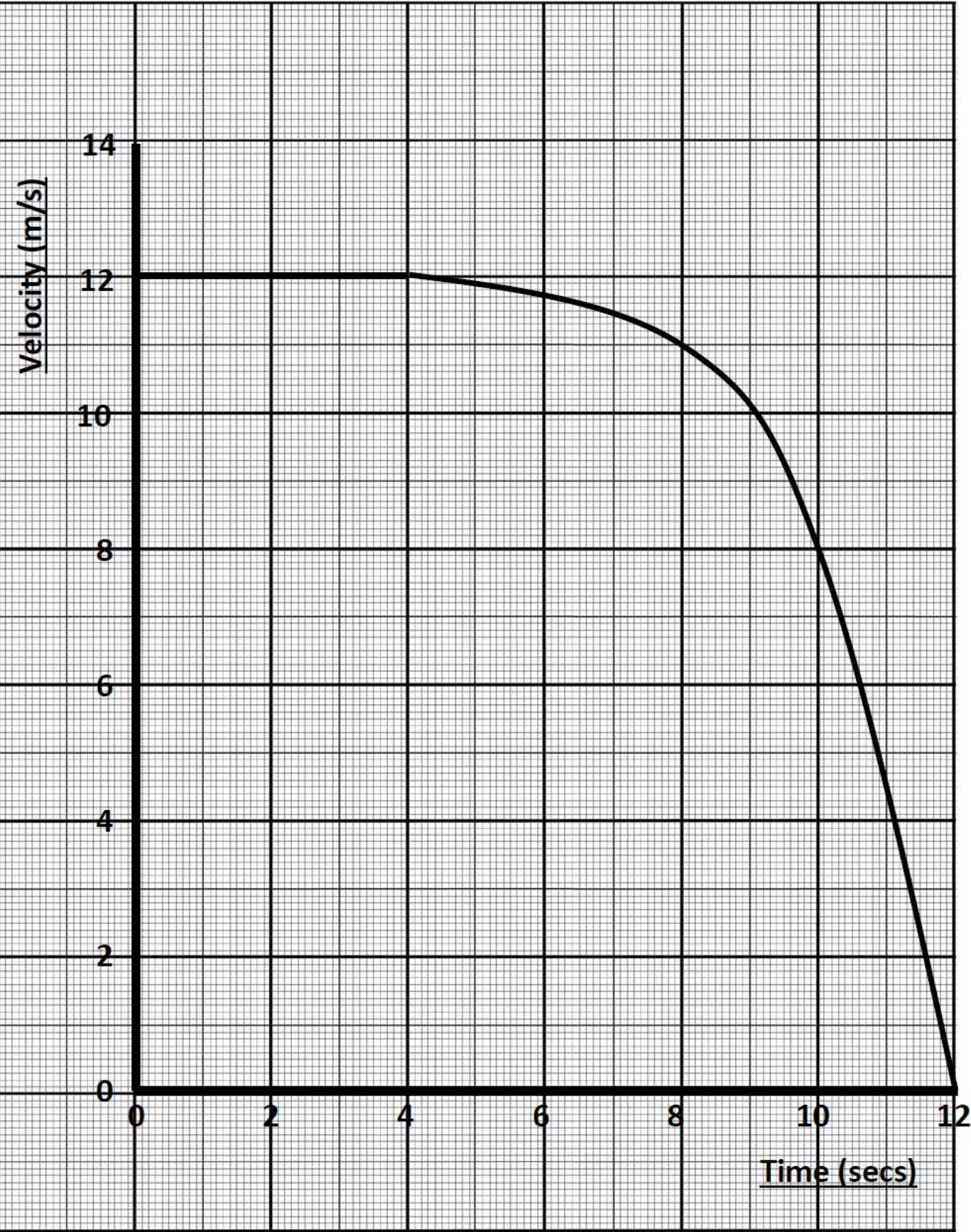
1. The velocity time graph below shows the first part of a train's journey.



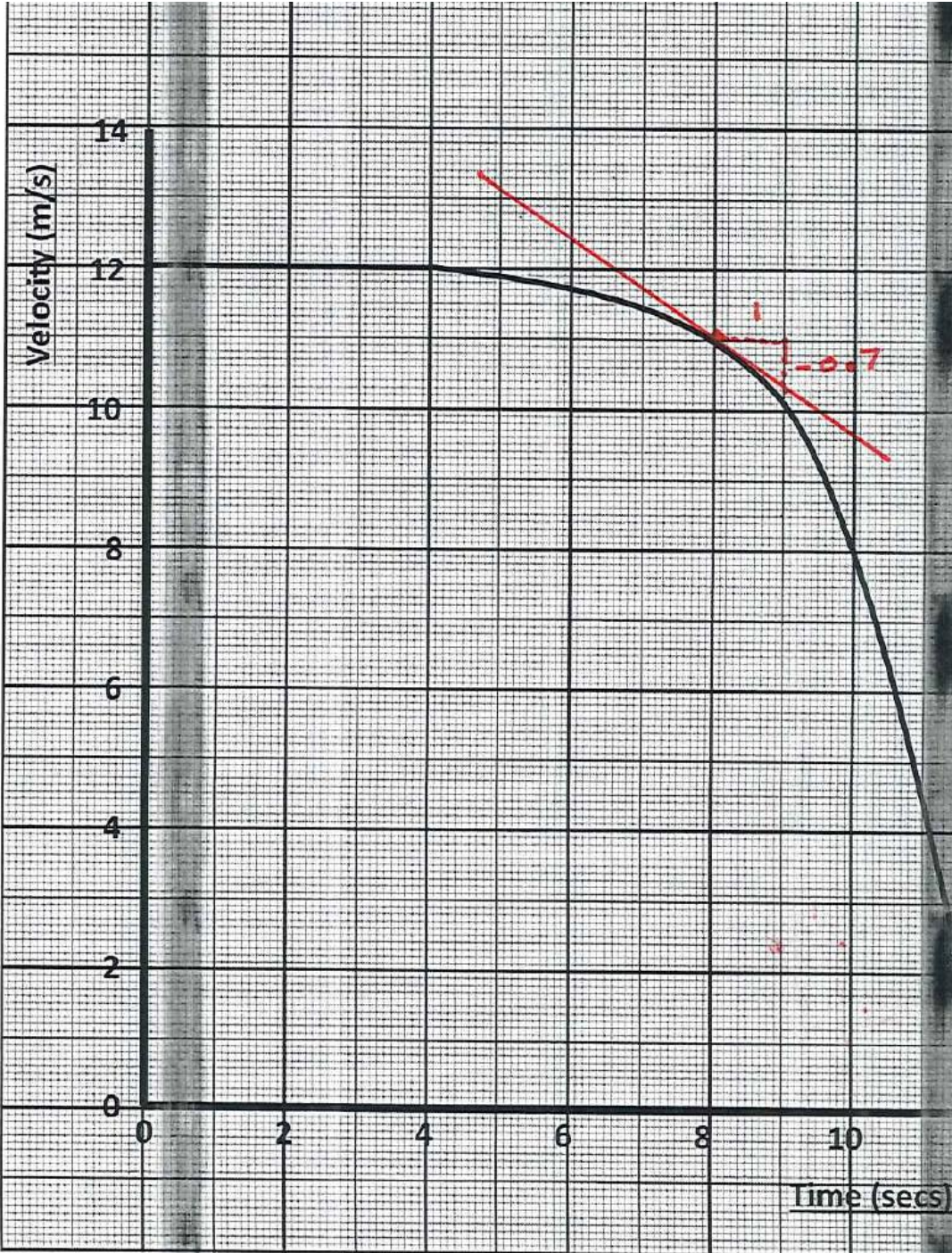
- Calculate the acceleration of the train at time $t = 6$
- Calculate the distance travelled by the train between 2 and 10 seconds. Use 4 strips of equal width.

$$22.9$$

2. The graph below shows the speed of a car as it approaches a junction.

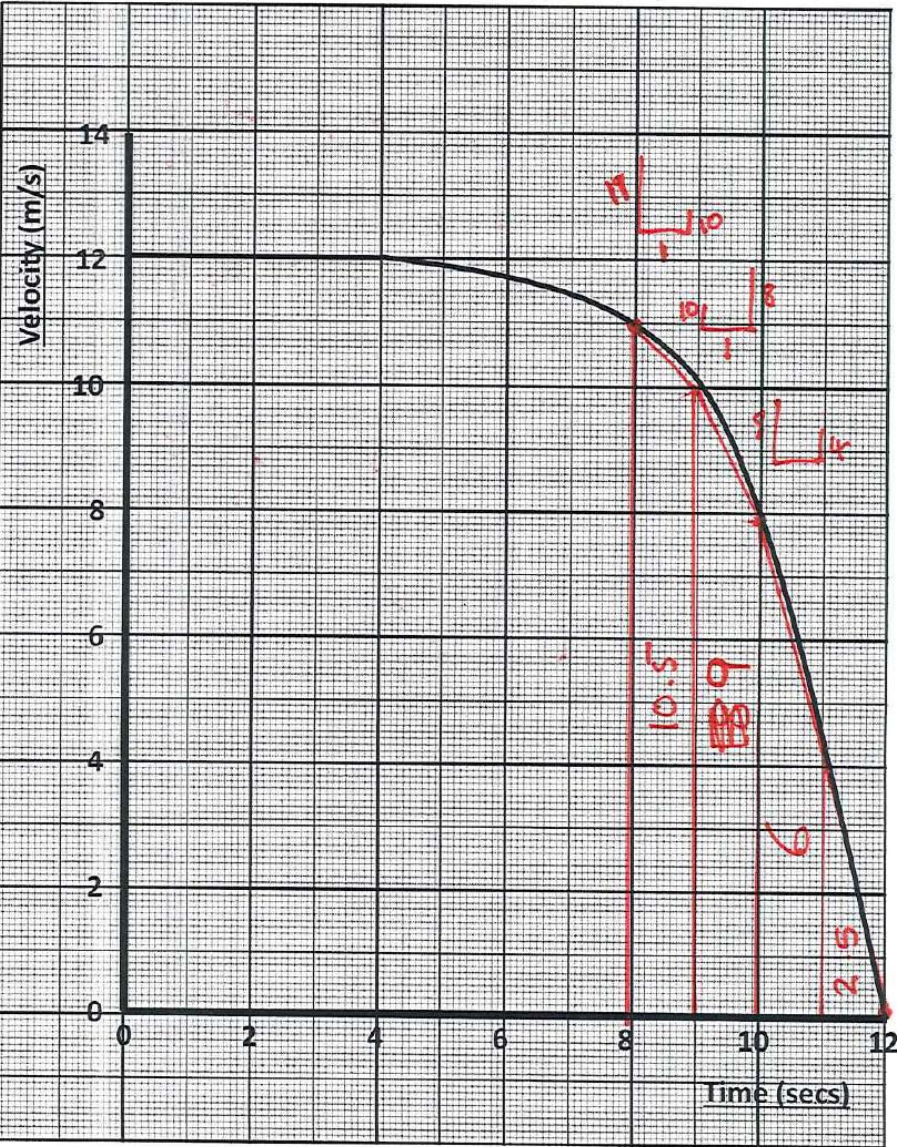


- a) Describe what is happening between 0 and 4 seconds
- b) Calculate the car's deceleration at time $t = 8$.
- c) Calculate the distance travelled by the car between 8 and 12 seconds. Use 4 strips of equal width.



- a) Describe what is happening between 0 and 4 seconds
- b) Calculate the car's deceleration at time $t = 8$

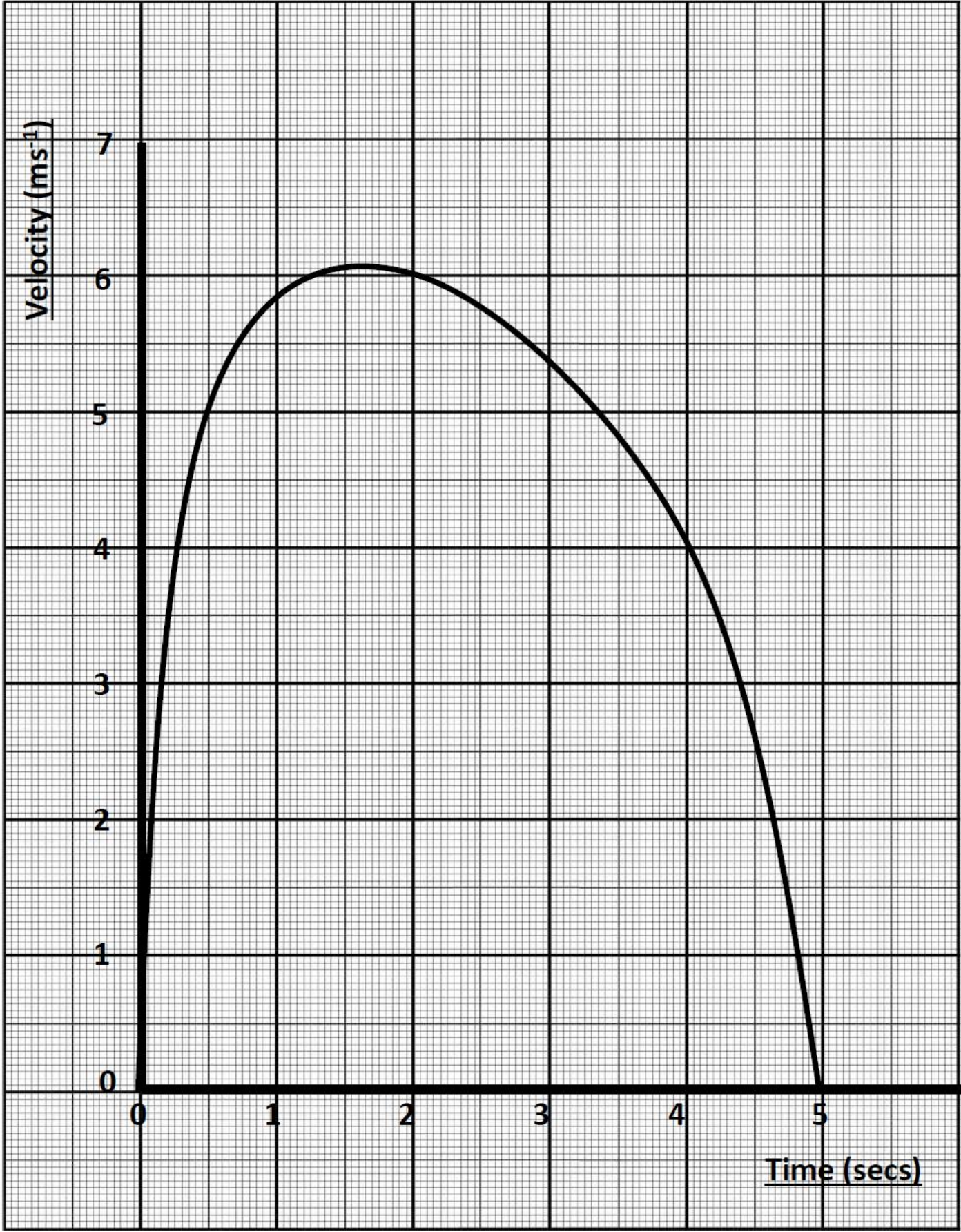
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- a) Describe what is happening between 0 and 4 seconds
- b) Calculate the car's deceleration at time $t = 8$.
- c) Calculate the distance travelled by the car between 8 and 12 seconds. Use 4 strips of equal width.

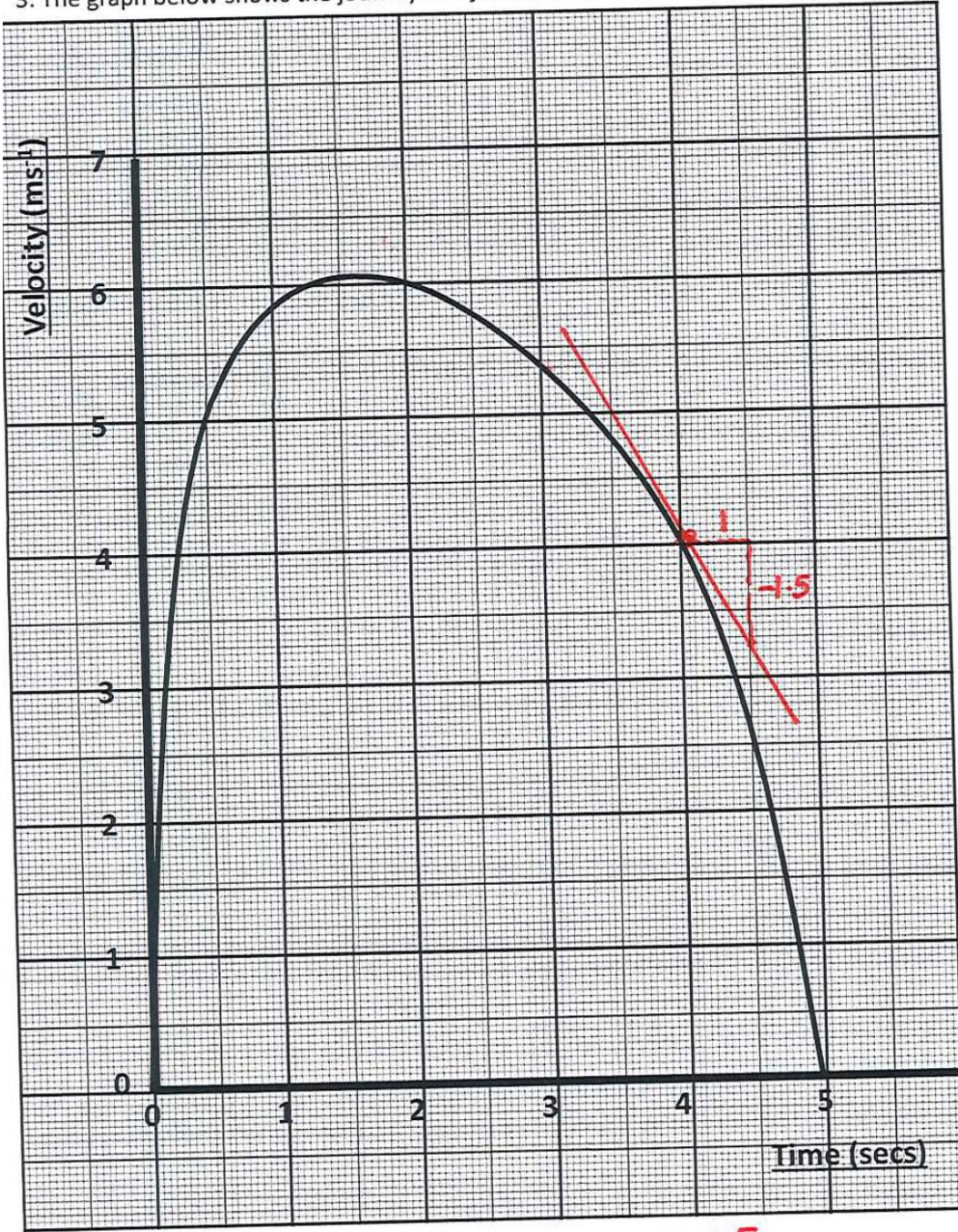
28

3. The graph below shows the journey of a javelin when thrown.

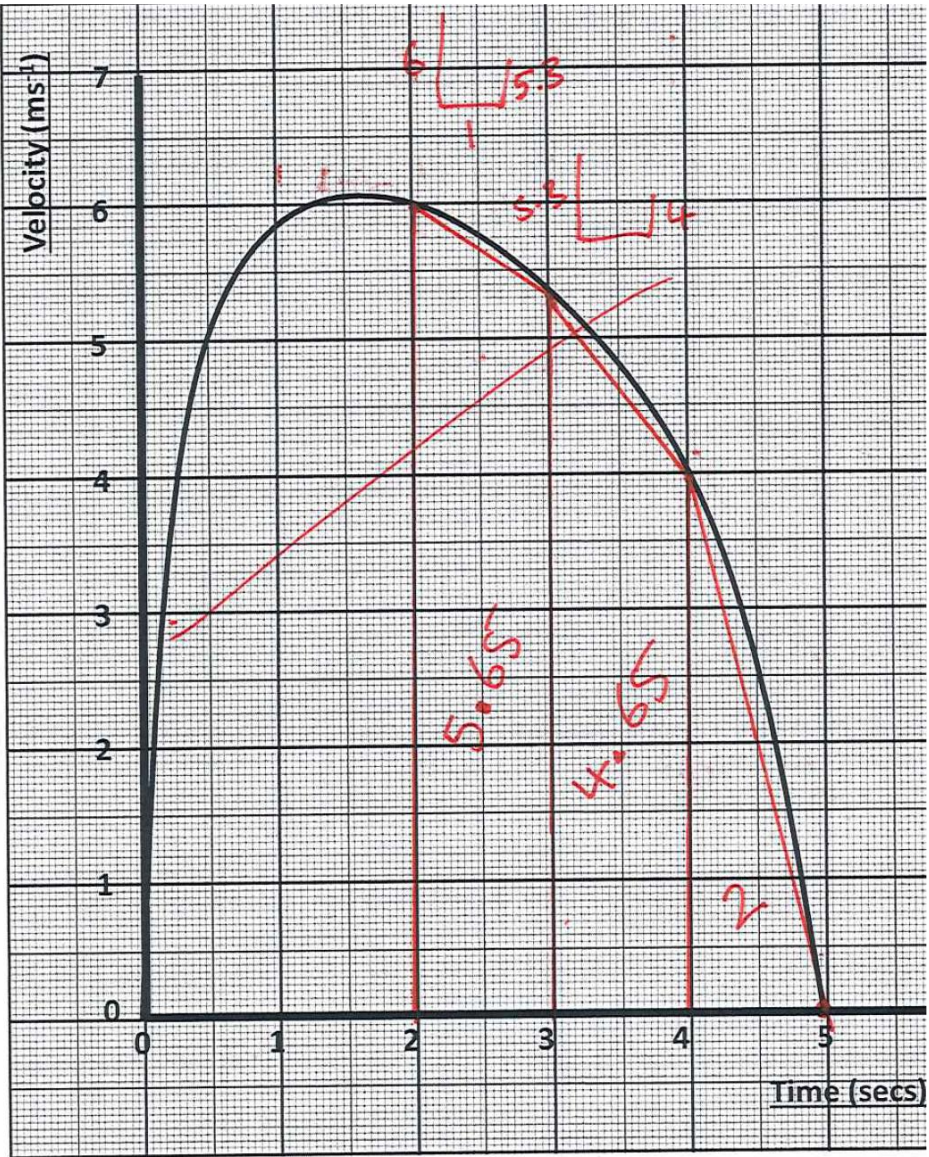


- a) Calculate the acceleration of the javelin at time $t = 4$.
- b) Calculate the distance travelled by the javelin between 2 and 5 seconds.

3. The graph below shows the journey of a javelin when thrown.



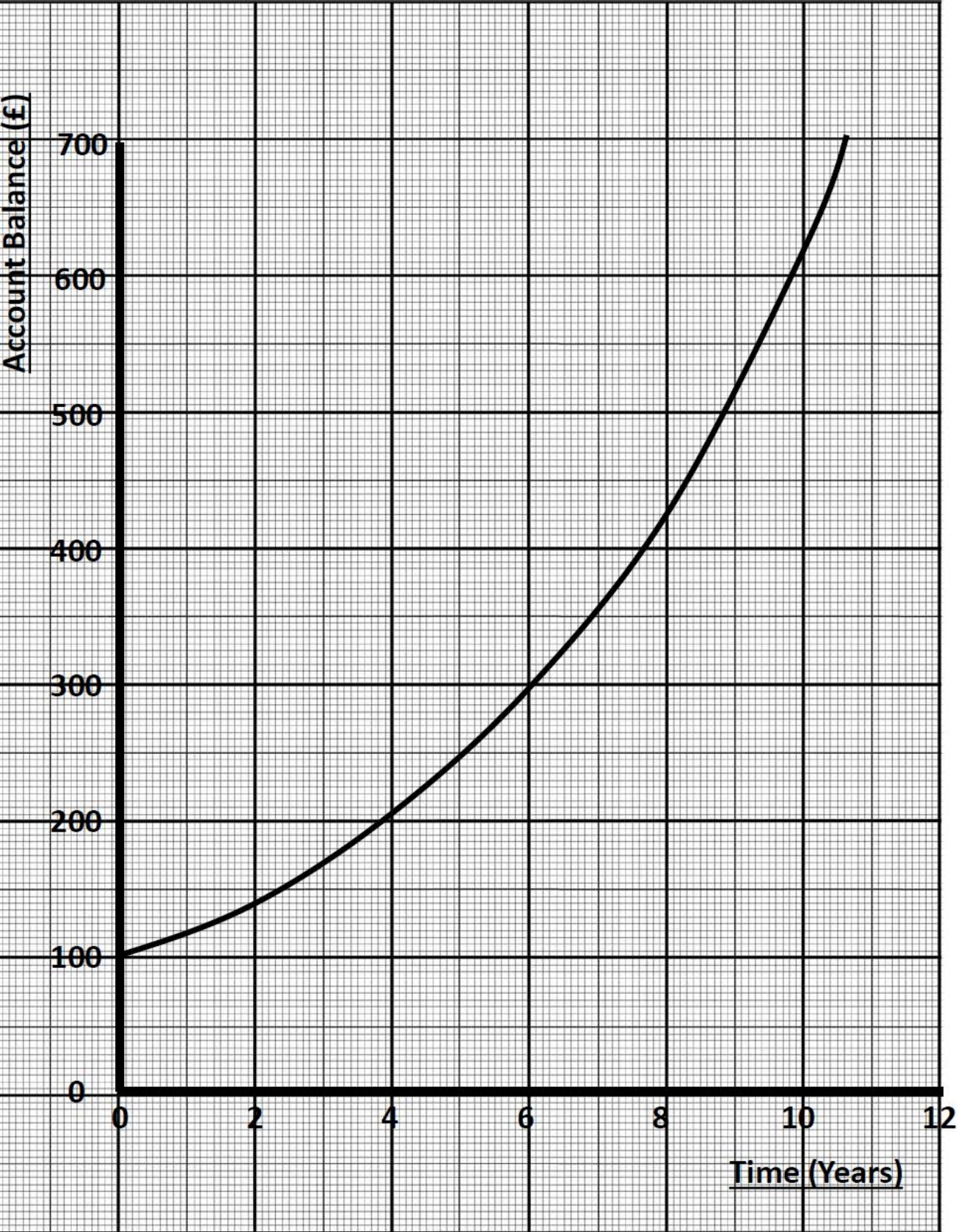
- a) Calculate the acceleration of the javelin at time $t = 4$. -1.5
- b) Calculate the distance travelled by the javelin between 2 and 5 seconds.



- a) Calculate the acceleration of the javelin at time $t = 4$.
- b) Calculate the distance travelled by the javelin between 2 and 5 seconds.

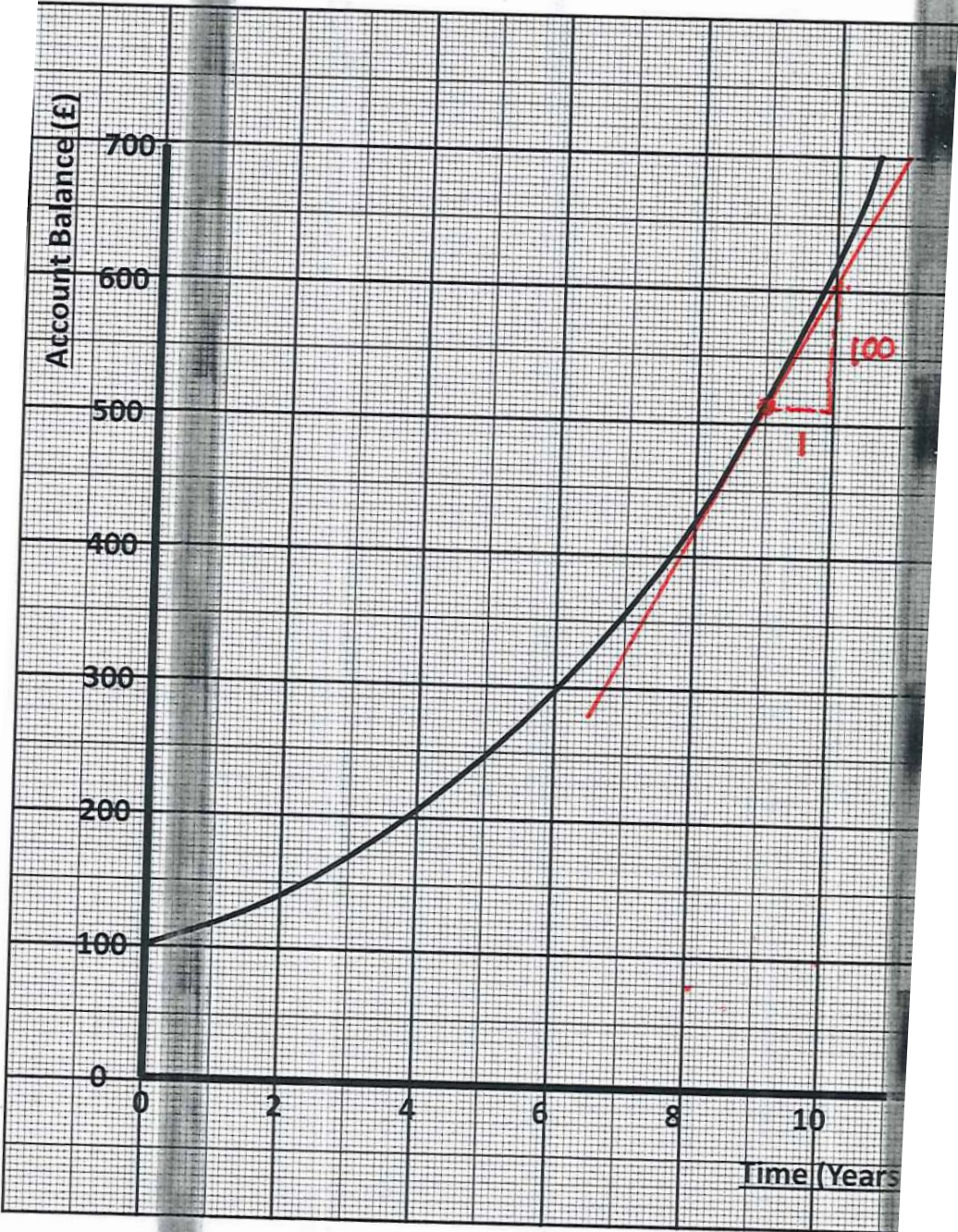
12.3

4. Will gets £100 which he puts in his bank. Each year he puts more money into his account to ensure the total increases by 20% each year. The graph below shows Will's account balance over a 10 year period.



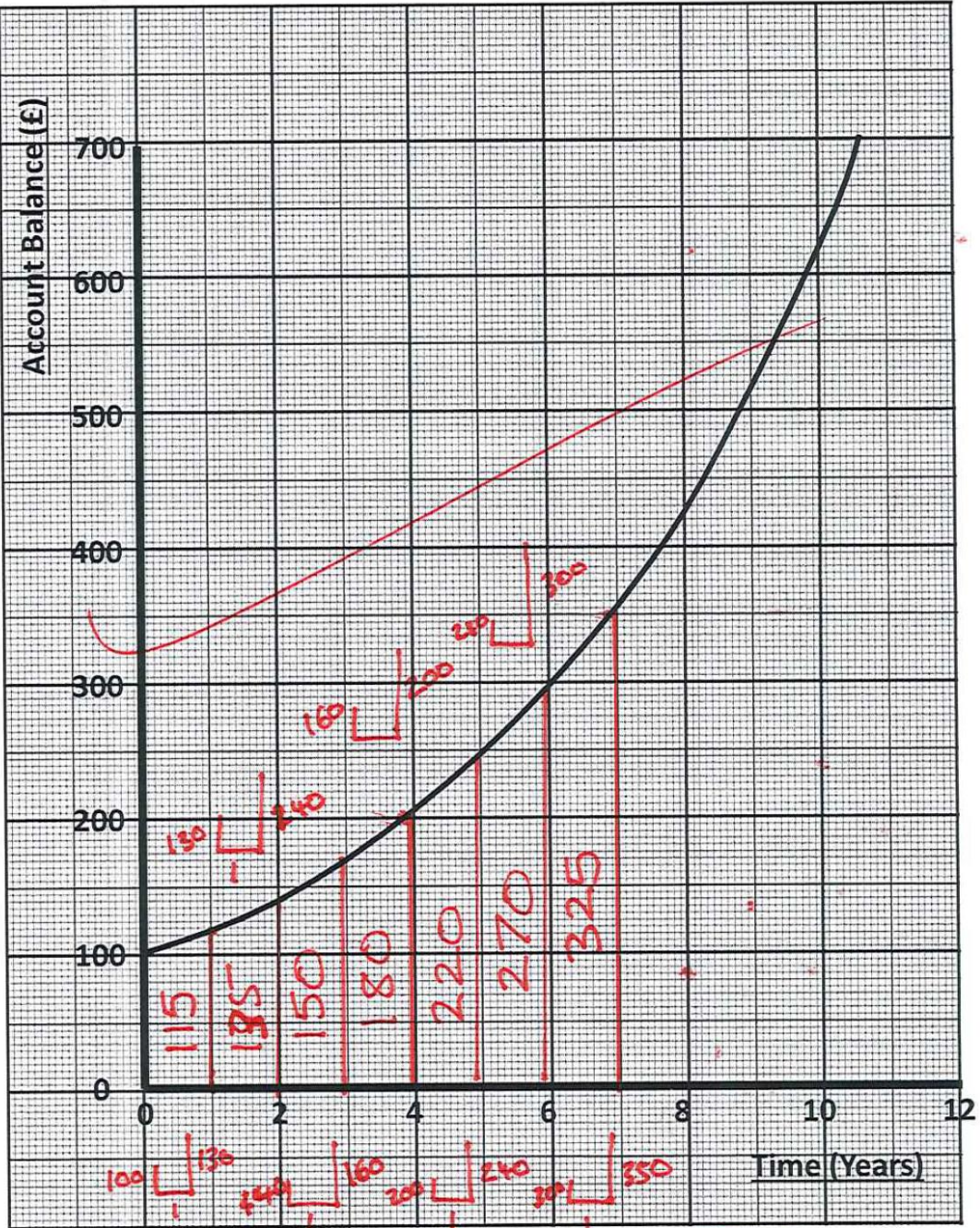
- a) How much money is in Will's account after 7 years?
- b) Calculate the rate of change of Will's balance in year 6. State the units in your answer.

4. Will gets £100 which he puts in his bank. Each year he puts more money into his account to ensure the total increases by 20% each year. The graph below shows Will's account balance over a 10 year period.



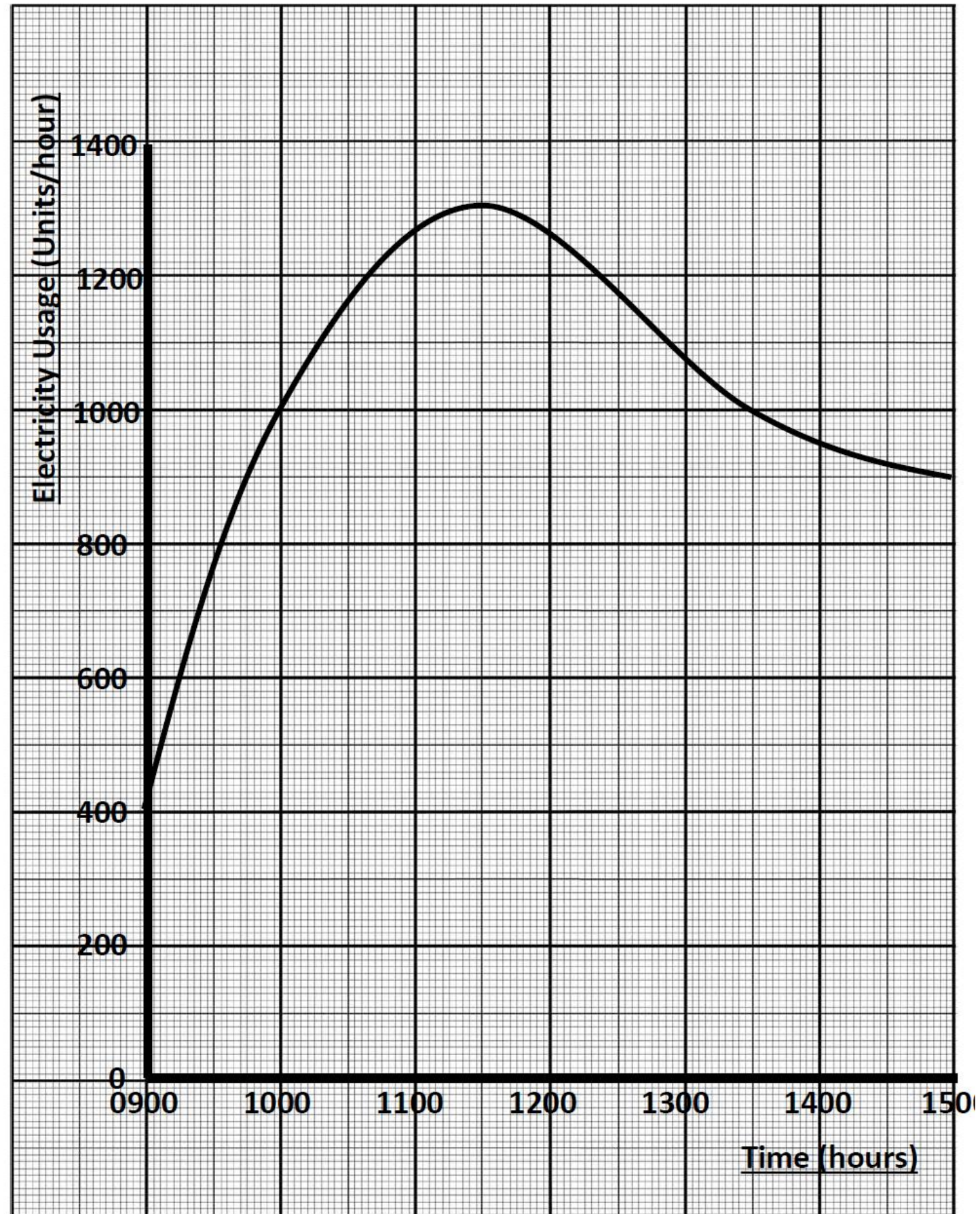
- a) How much money is in Will's account after 7 years? 100

4. Will gets £100 which he puts in his bank. Each year he puts more money into his account to ensure the total increases by 20% each year. The graph below shows Will's account balance over a 10 year period.



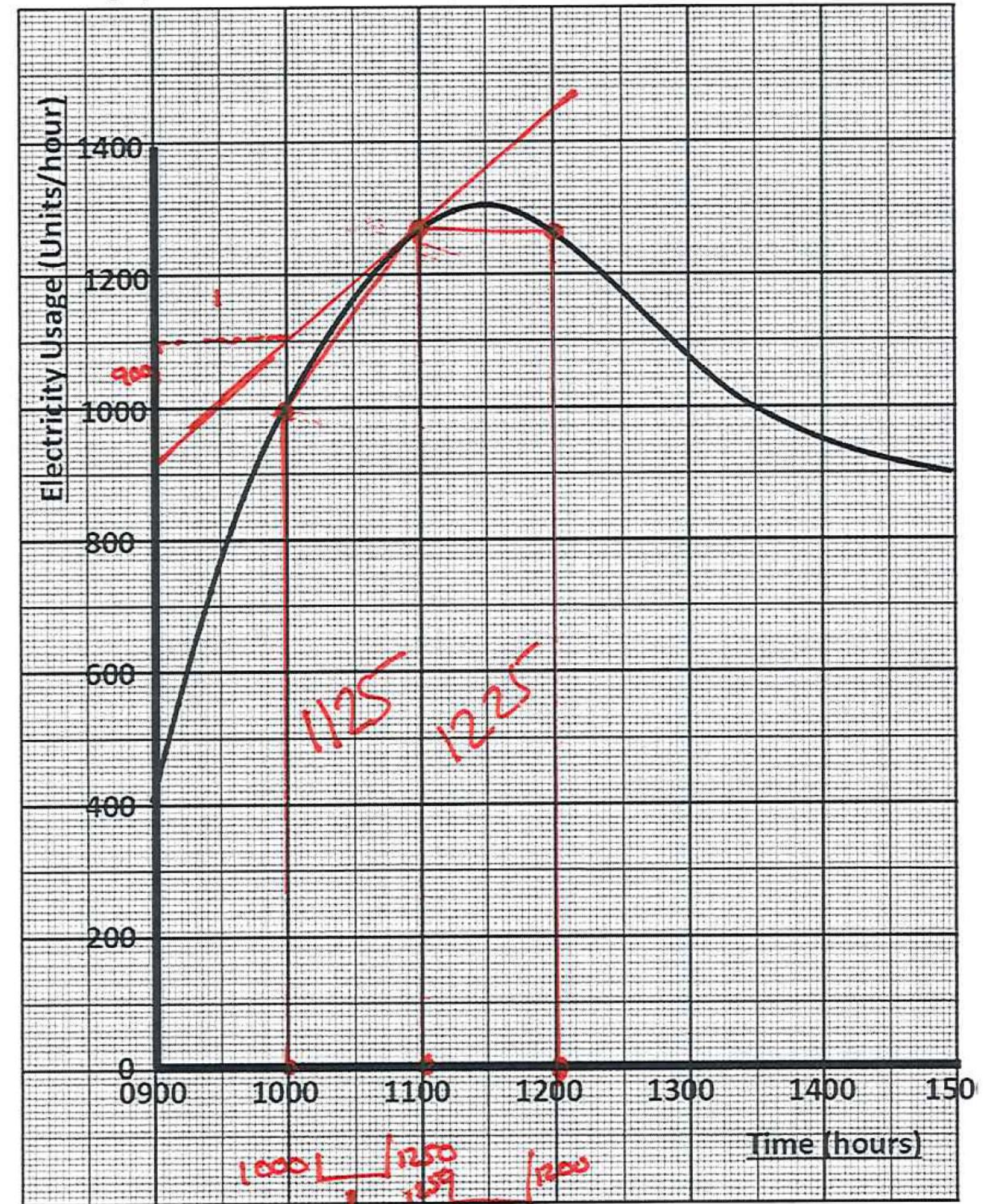
- a) How much money is in Will's account after 7 years? £1395
- b) Calculate the rate of change of Will's balance in year 6. State the units in your answer.

5. The graph below shows the electricity usage by a church hall.



- Calculate the rate of change of the electricity usage at 11:00.
- Calculate the amount of electricity used by the church hall between 10:00 and 12:00. State the units in your answer.

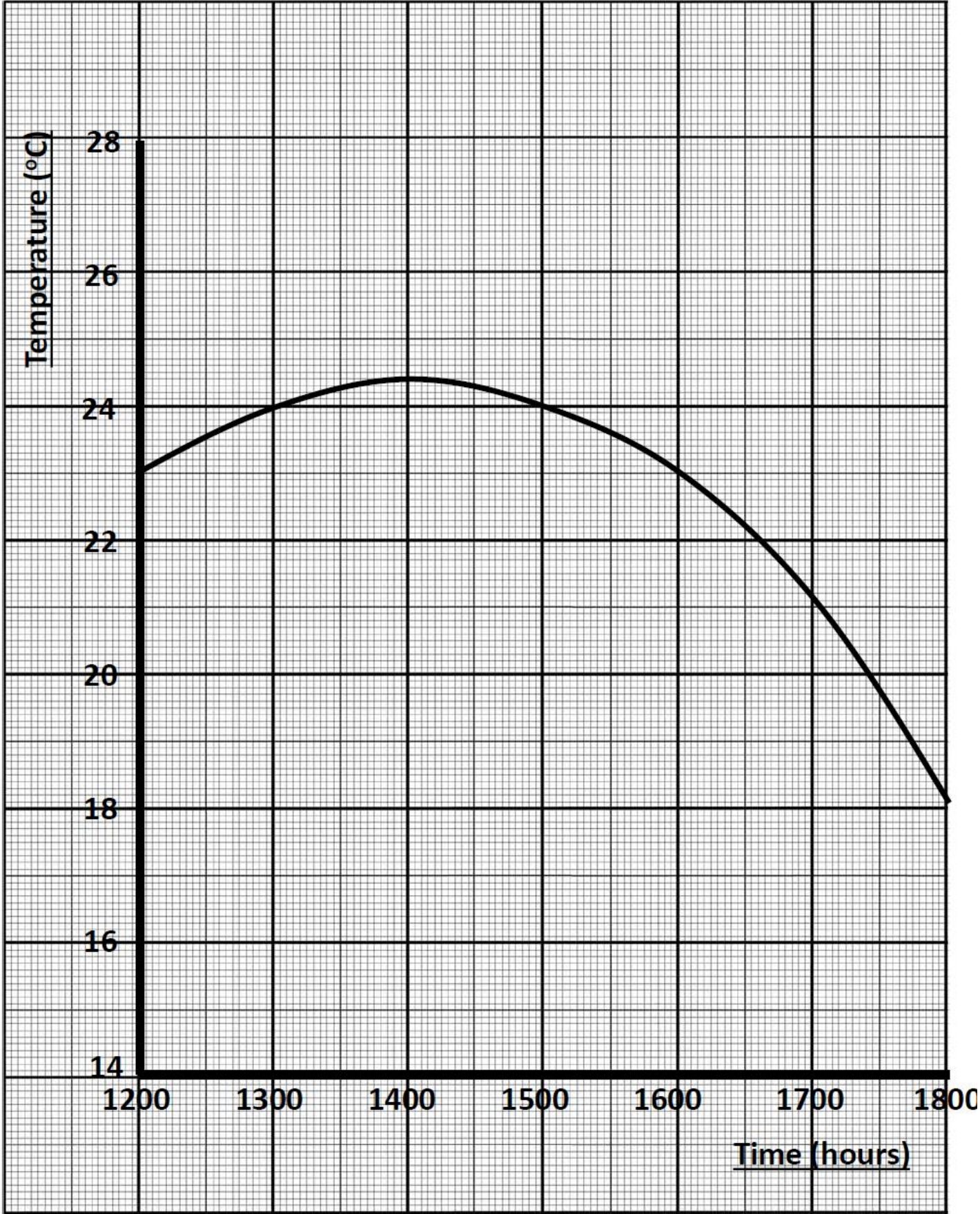
5. The graph below shows the electricity usage by a church hall.



- Calculate the rate of change of the electricity usage at 11:00.
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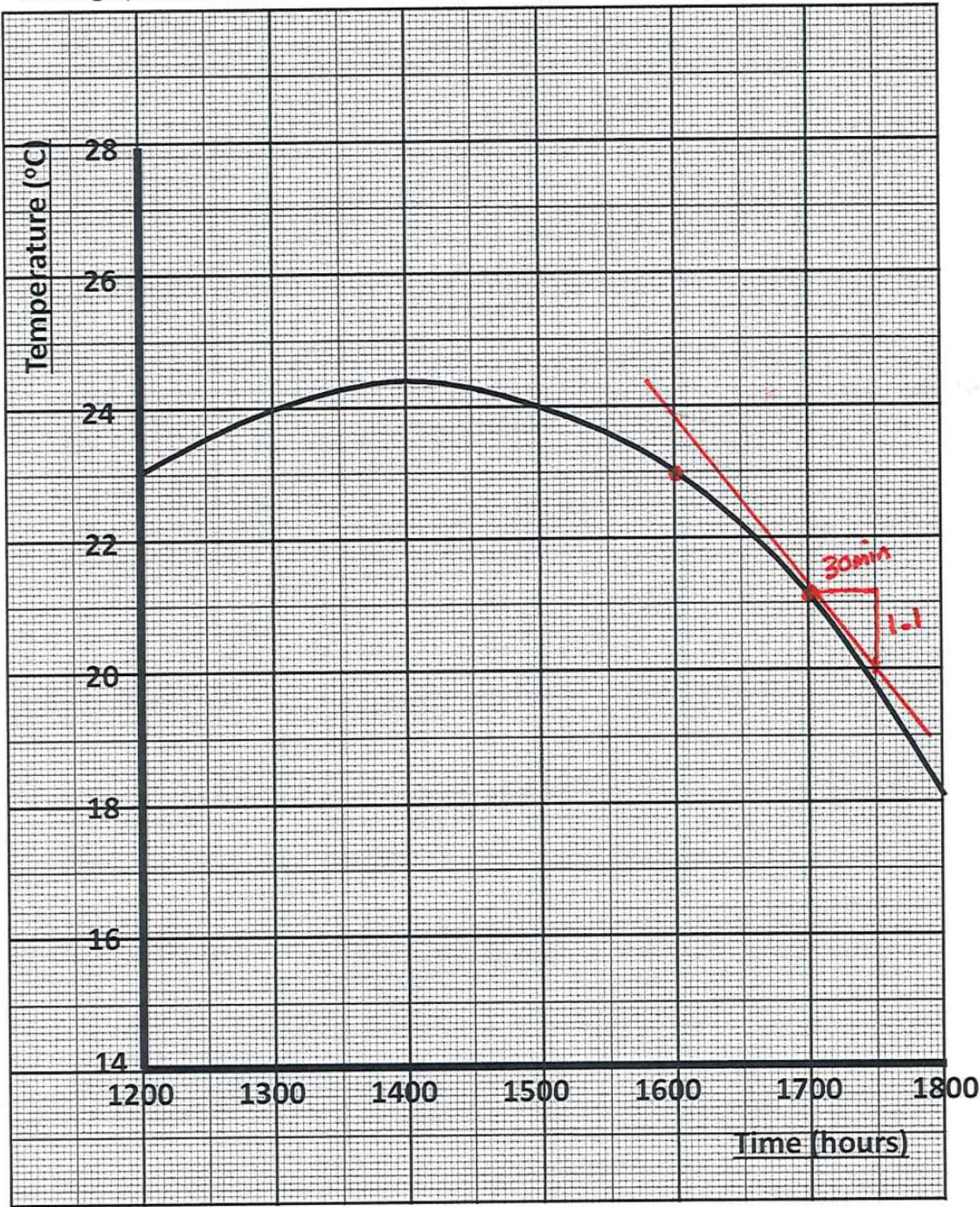
2350

6. The graph below shows the temperature during part of one day in June.



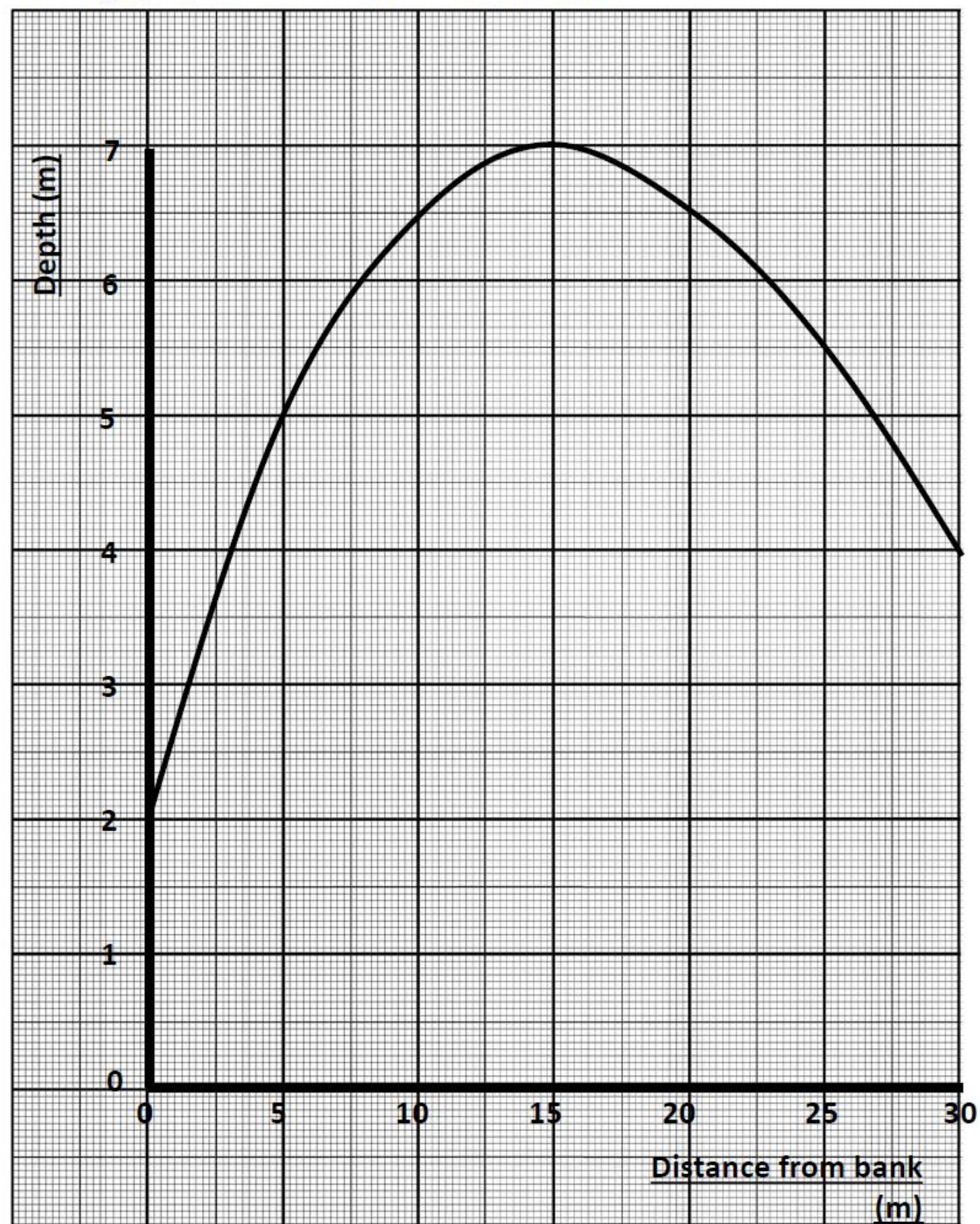
- a) What is the temperature at 16:00?
- b) Calculate the gradient at 17:00
- c) Describe what you have calculated in part b), stating any units.

6. The graph below shows the temperature during part of one day in June.



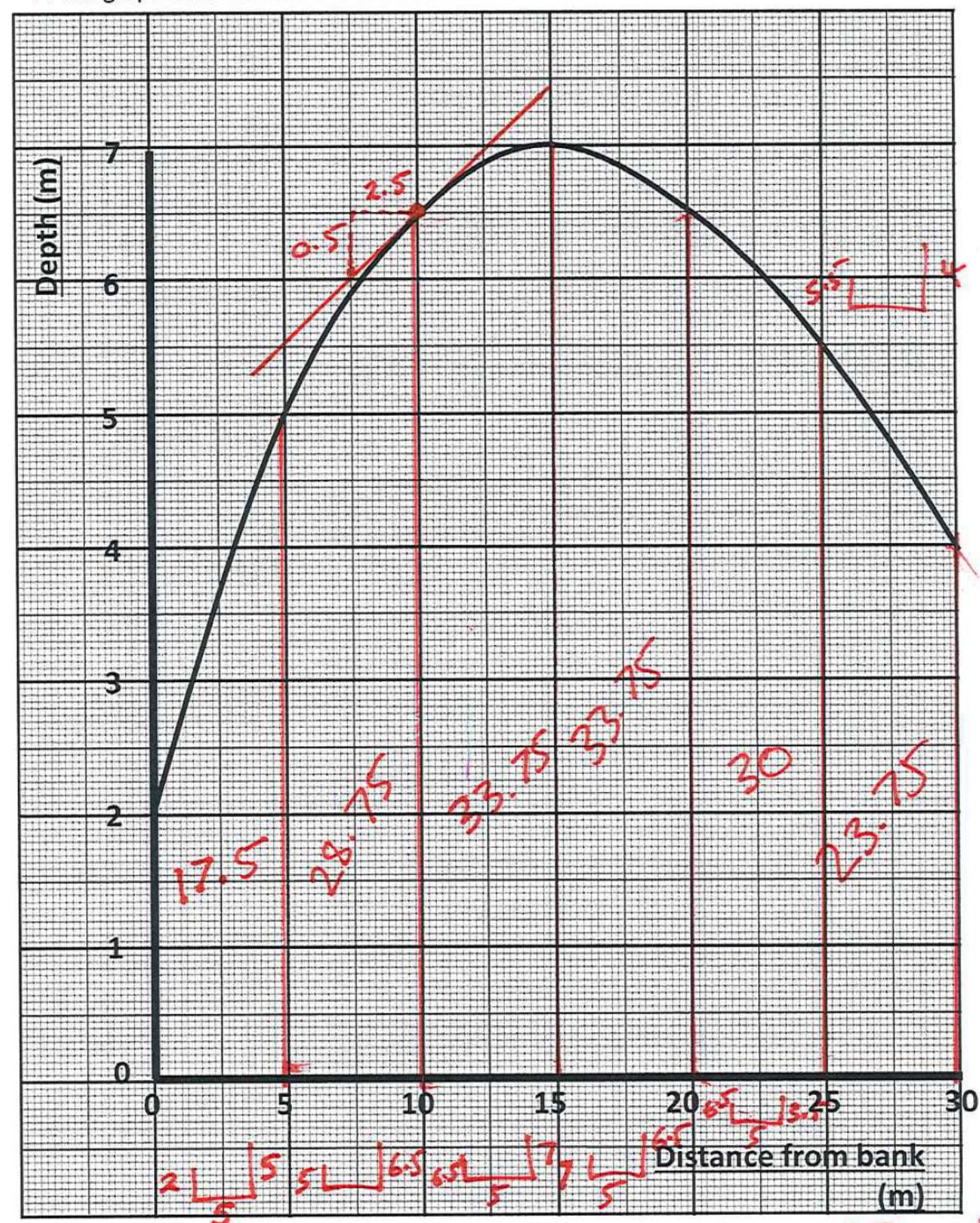
- a) What is the temperature at 16:00? *23°*
- b) Calculate the gradient at 17:00 *- 2.2*
- c) Describe what you have calculated in part b), stating any units. *or per hour*

7. The graph below shows the cross-section of a river.



- Calculate the rate of change in depth of the river 10m from the bank.
- Calculate the area of the cross-section. Use 6 strips of equal widths

7. The graph below shows the cross-section of a river.



- Calculate the rate of change in depth of the river 10m from the bank.
- Calculate the area of the cross-section. Use 6 strips of equal widths

$$\frac{0.5}{2.5} = \frac{1}{5}$$

167.5