

## Time Series Graphs - Worksheet

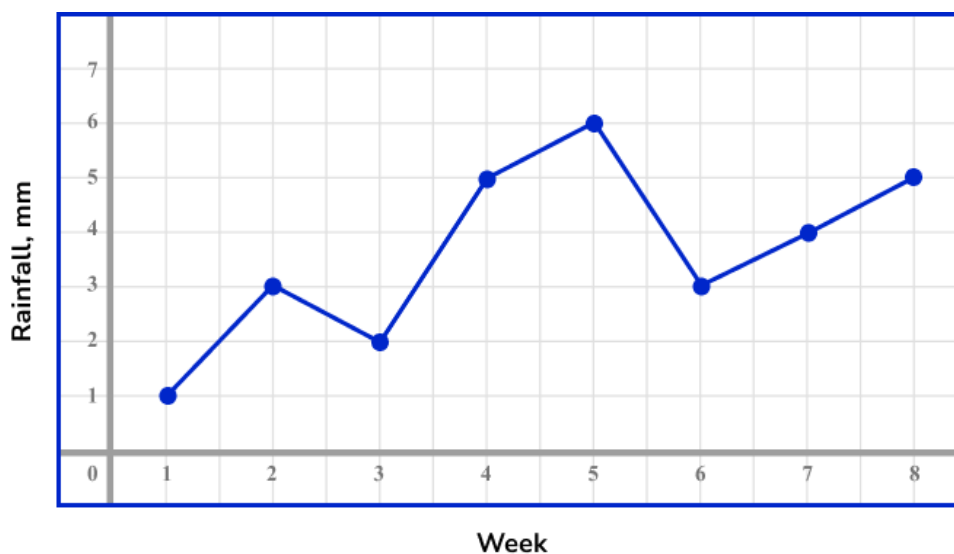
### Skill

#### Group A - Reading from time series graphs

Find the required information from the time series graphs:

1) The time series graph shows information about the rainfall, in *mm*, in a garden over the period of 8 weeks.

- Which week has the highest rainfall?
- What is the range of the amounts of rainfall over the 8 week period?



2) The time series graph shows the average temperature recorded in a city in quarter year periods over the years 2020 and 2021.

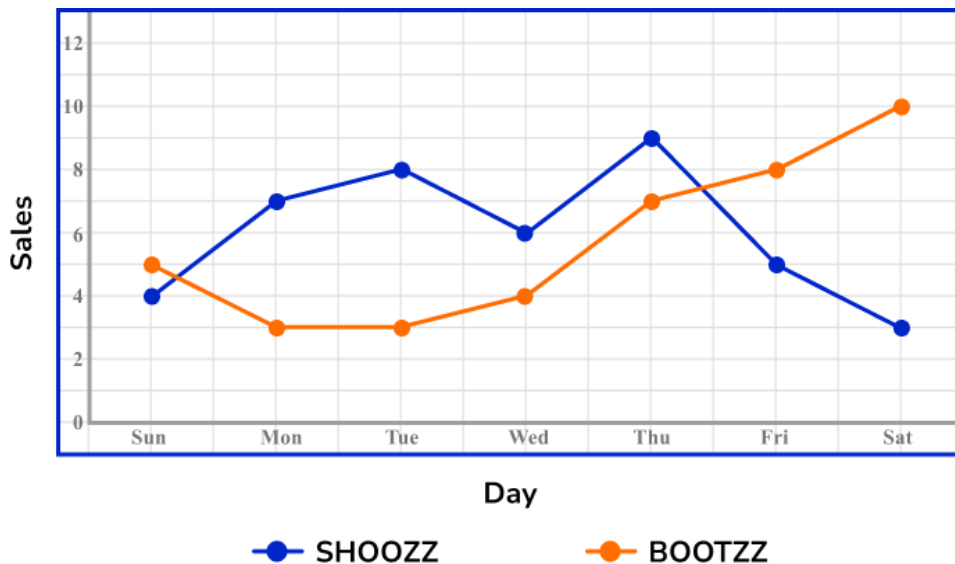
- What is the difference between the temperatures in Q2 of 2020 and Q2 of 2021?
- What was the highest average temperature?



## Time Series Graphs - Worksheet

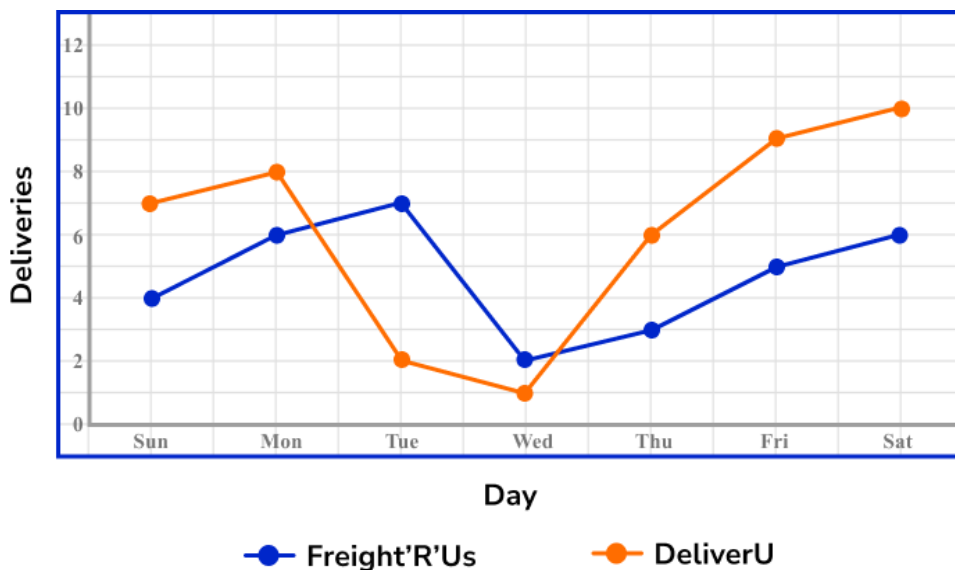
3) The time series graph shows the sales of flip flops sold in two different shoe shops, SHOOZZ and BOOTZZ over the period of one week.

- Which shoe shop sold the most flip flops that week?
- On what day were the sales in SHOOZZ 4 more than the sales in BOOTZZ?



4) The time series graph shows the number of parcel deliveries made by 2 different delivery companies during one week.

- What is the difference between the total deliveries made by each company that week?
- Which company delivered the most parcels that week?



## Time Series Graphs - Worksheet

### Group B - Drawing time series graphs

Use the data provided to draw time series graphs on graph paper:

**1)** The table shows information about the average temperature recorded in a city in quarter year periods over the years 2018 and 2019. Draw a time series graph for the data.

Year	2018				2019			
Quarter	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Temp, °C	9	10	17	14	5	13	20	16

**2)** The table shows information about the rainfall measured in a garden over an 8 week period. Draw a time series graph for the data.

Week	1	2	3	4	5	6	7	8
Rainfall, mm	50	45	42	46	52	60	59	48

**3)** The table shows information about the sales, in thousands, of a company each month for a year. Draw a time series graph for the data.

Month	J	F	M	A	M	J	J	A	S	O	N	D
Sales (1000s)	4.8	3.6	2.2	5.4	6	7.2	6.6	5.8	4.6	6.4	7.8	8.2

**4)** The table shows information about the temperature of soup being heated on a hob. Draw a time series graph for the data.

Time, s	0	10	20	30	40	50	60	70	80	90	100
Temp, °C	34	36	37	40	44	50	55	59	65	71	78

## Time Series Graphs - Worksheet

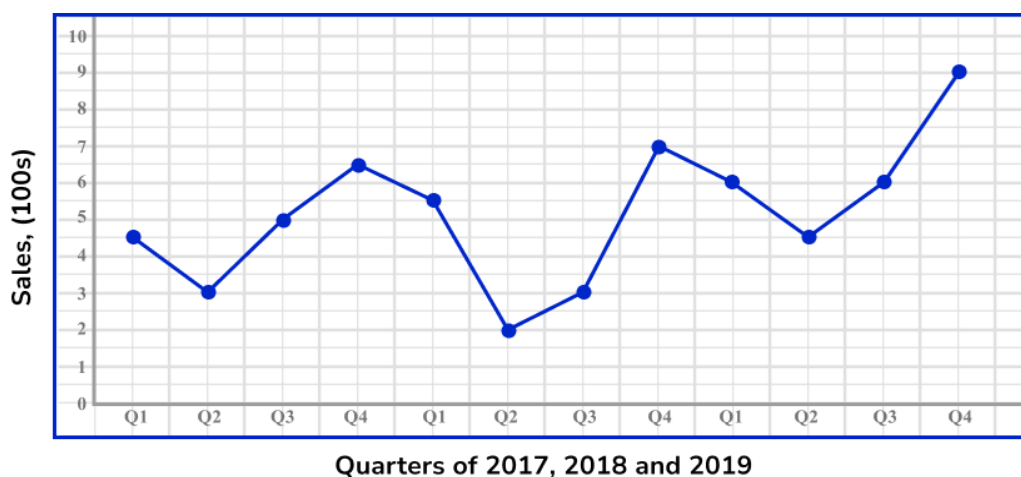
### Group C - Interpreting trend from time series graphs

Answer the questions and describe the trend of each time series graph:

**1)** The table and time series graph show information about the sales, in hundreds, of a company over a 3 year period.

By looking at the sales in Q1 for 2017, 2018 and 2019 and then looking at the sales in the Q2s, Q3s and Q4s, describe the trend on the sales of the company for the 3 year period.

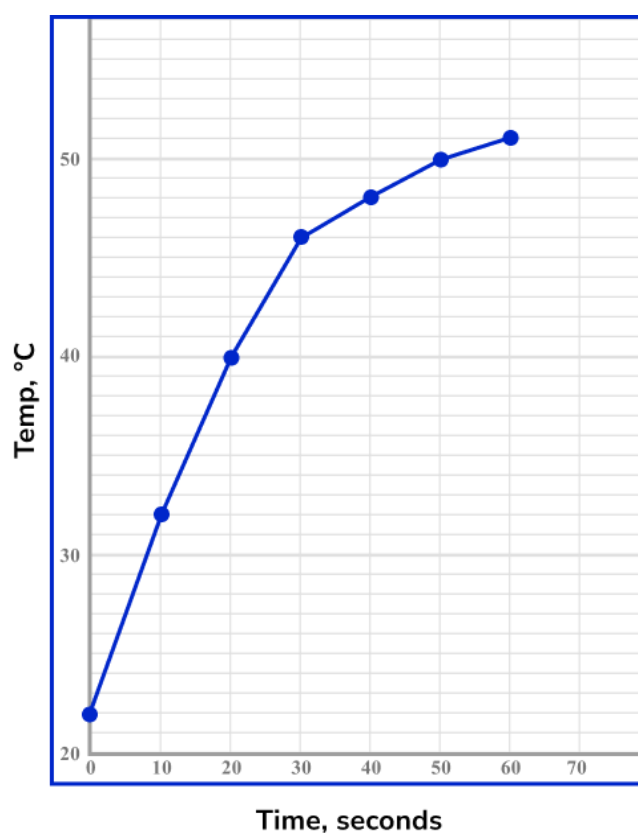
	2017				2018				2019			
Quarter	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Sales(100s)	4.4	3	5	6.5	5.5	2	3	7	6	4.5	6	9



## Time Series Graphs - Worksheet

2) The table and time series graph show the temperature of a liquid being heated over a flame. By continuing the shape of the time series graph, predict the temperature of the liquid after 70 seconds.

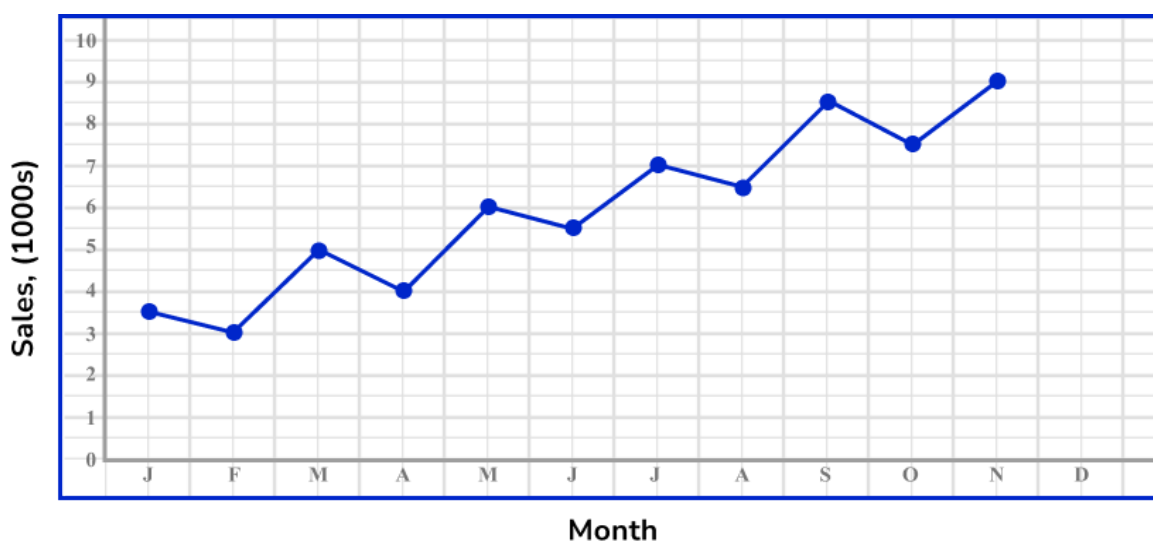
Time, s	0	10	20	30	40	50	60
Temp, °C	22	32	40	46	48	50	51



## Time Series Graphs - Worksheet

3) The table and time series graph show the sales, in thousands, of a company between January and November. Use a line of best fit to predict the sales in December.

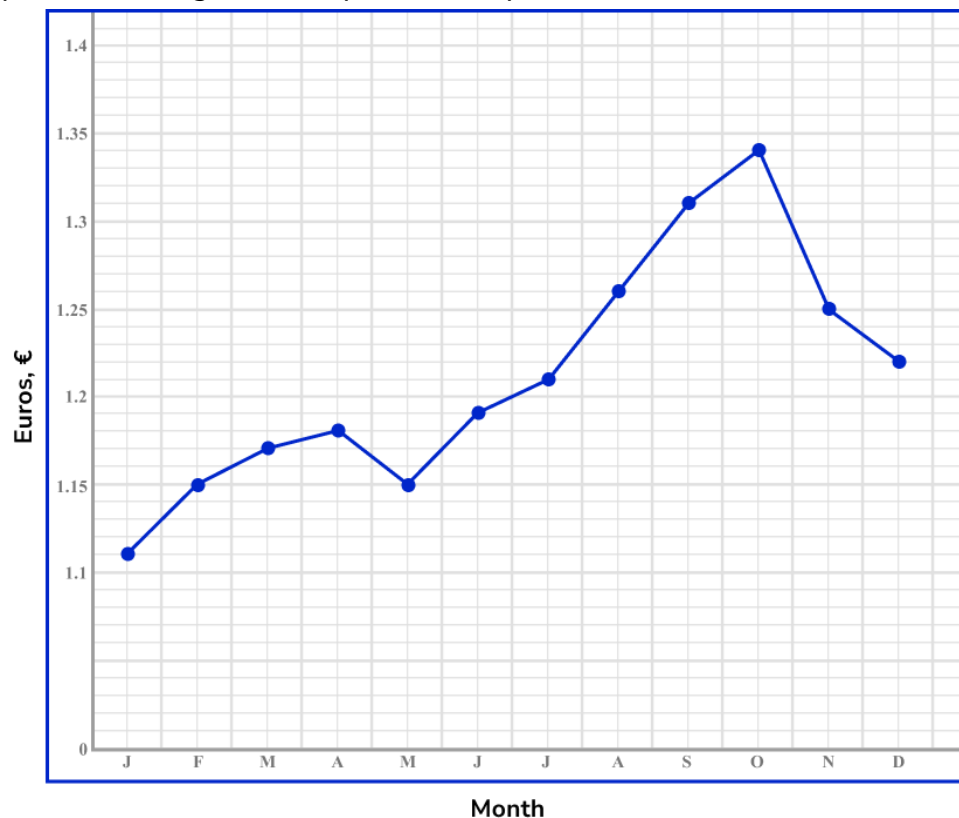
Month	J	F	M	A	M	J	J	A	S	O	N	D
Sales (1000s)	3.5	3	5	4	6	5.5	7	6.5	8.5	7.5	9	



## Time Series Graphs - Worksheet

### Applied

- 1) The time series graph shows information about the exchange rate value of the Euro for one pound sterling over the period of a year.



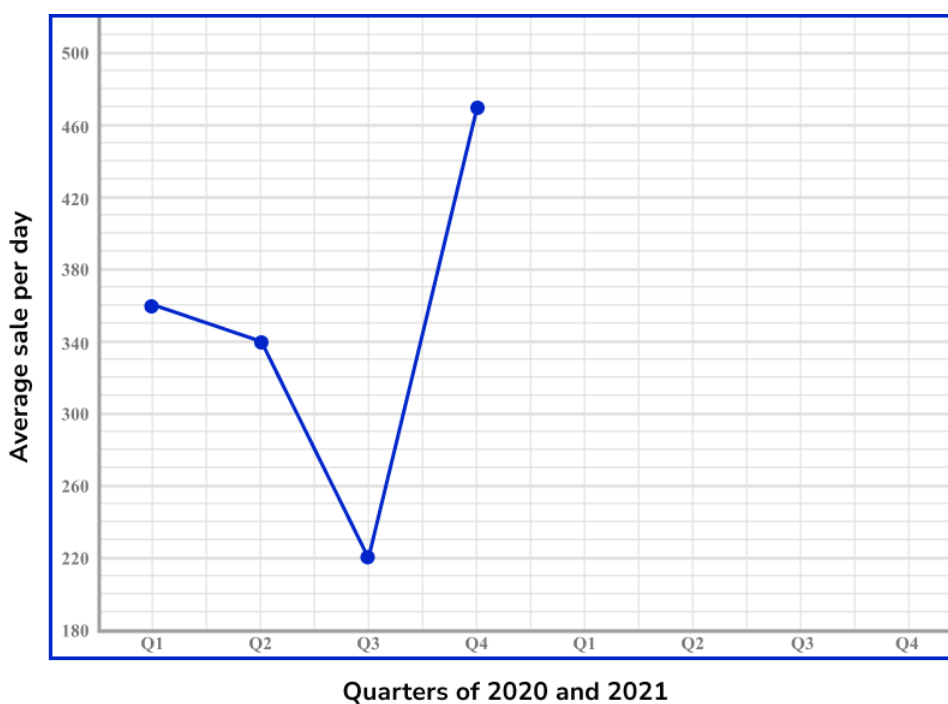
- (a) Describe the trend of the data between January and October.
- (b) Would it be suitable to use the trend of the data to make a prediction about the value of the Euro in January of the following year?

## Time Series Graphs - Worksheet

- 2)** The table shows information about the sales made by a shop over a 2 year period. The time series graph shows the data plotted for 2020.

Year	2020				2021			
Quarter	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Average sales per day	360	340	220	470	400	360	250	520

- (a)** Complete the time series graph for 2021.

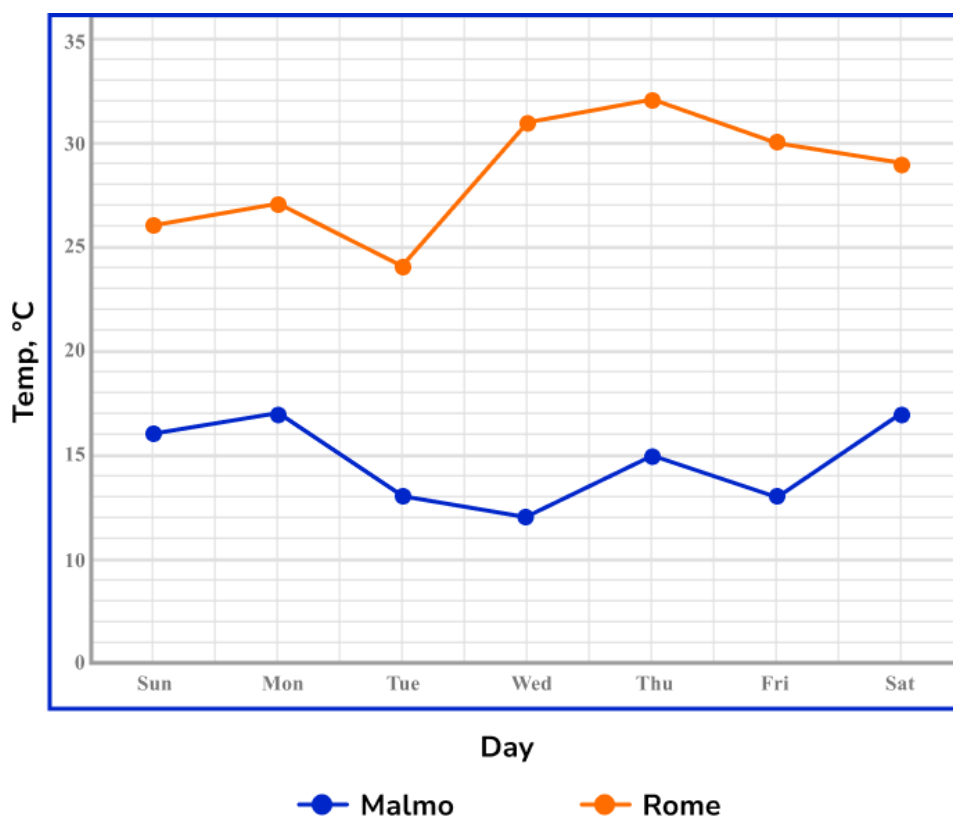


- (b)** By looking at the table and the time series graph, describe how the shop has performed over the 2 years.



## Time Series Graphs - Worksheet

- 3) The time series graph shows the maximum temperatures reached during a week in Malmo and Rome.

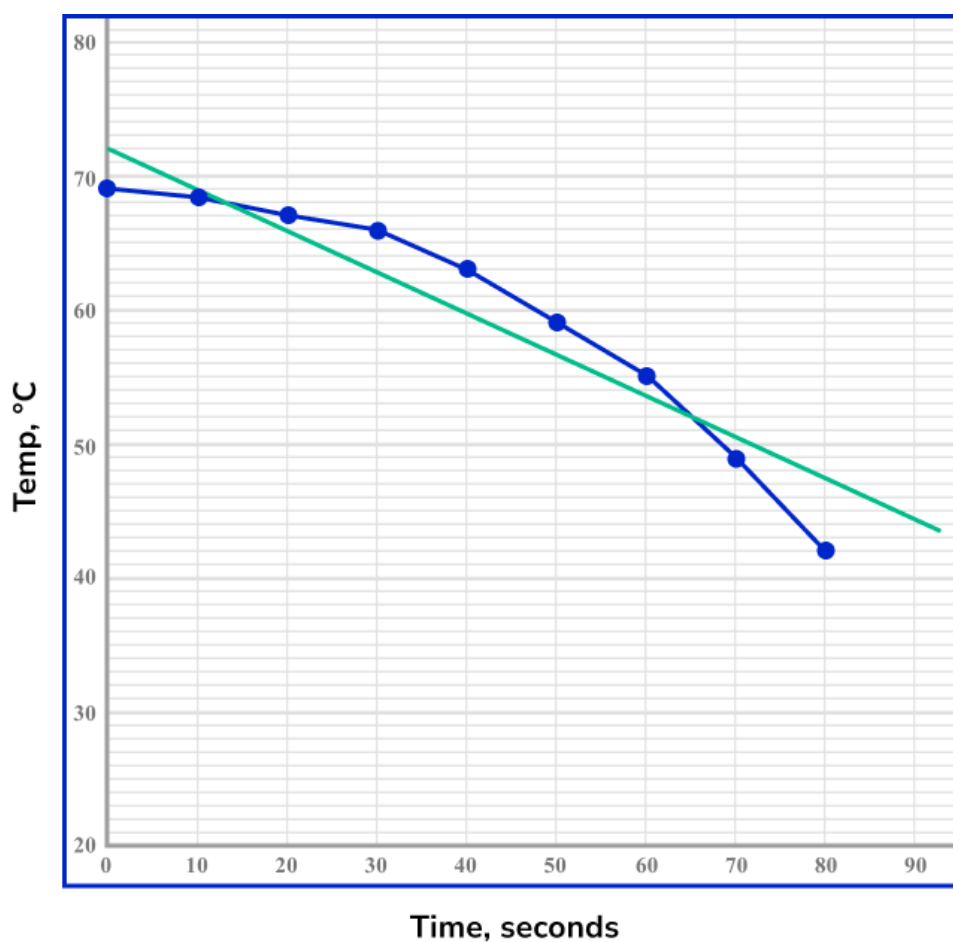


- (a) On which day was the biggest difference in the temperatures of the two cities?
- (b) Use the data to find the mean temperatures of both cities for that week.

## Time Series Graphs - Worksheet

- 4) John did an experiment where he had to measure the temperature of a liquid every 10 seconds for 80 seconds. He recorded his data in a table and plotted a time series graph.

Time, s	0	10	20	30	40	50	60	70	80
Temp, °C	69	68.5	67	66	63	59	55	49	42



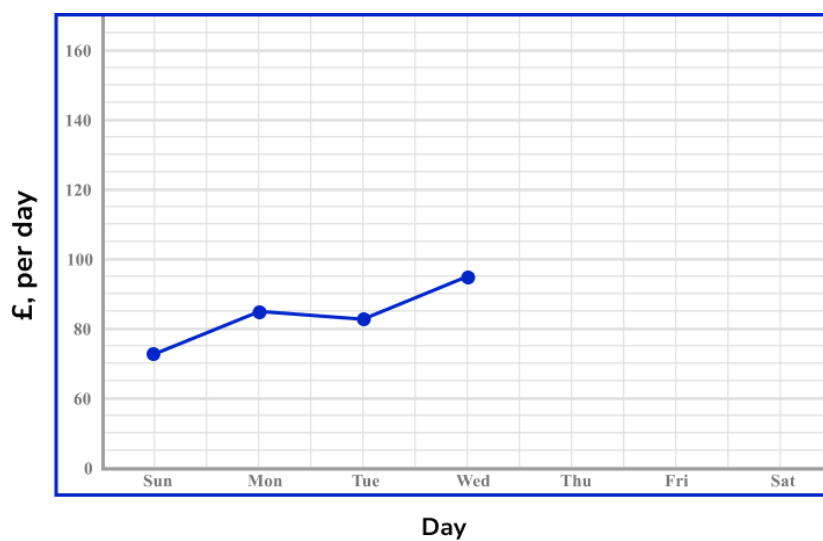
- (a) John wanted to predict the temperature of the liquid after 90 seconds. He used a line of best fit. Explain why this was not the correct method to use.
- (b) Use the table or time series graph to make a better prediction of the temperature after 90 seconds.

## Time Series Graphs - Exam Questions

- 1) The table shows the amount of money a taxi driver earned during one week.

Day	Sun	Mon	Tue	Wed	Thu	Fri	Sat
£, per day	73	86	82	95	92	115	140

- (a) Complete the time series graph for Thursday to Saturday.



(2)

- (b) Describe the trend of the data.

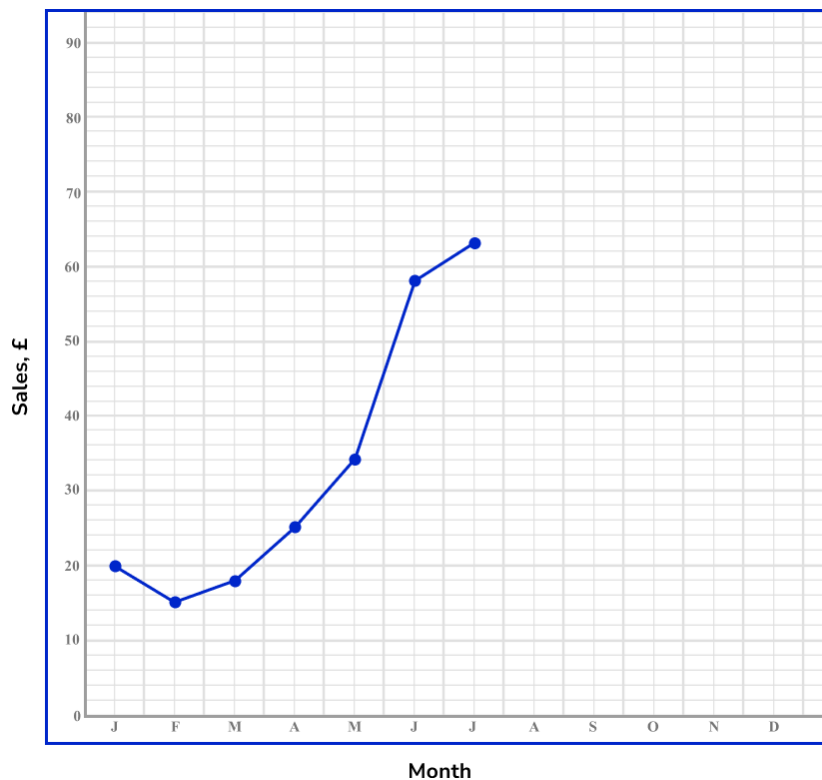
.....  
(1)

(3 marks)

## Time Series Graphs - Exam Questions

- 2) The table shows the average daily sales of an ice cream van over the period of a year.

Month	J	F	M	A	M	J	J	A	S	O	N	D
Sales, £	20	15	17	25	34	58	63	79	62	43	32	



- (a) Complete the time series graph for the months August to November. (2)
- (b) Use the trend of the data between August and November to predict the value for December. (1)

(3 marks)

## Time Series Graphs - Exam Questions

- 3) Below is a time series graph showing the amount of rainfall.  
State two mistakes that have been made with the time series graph.

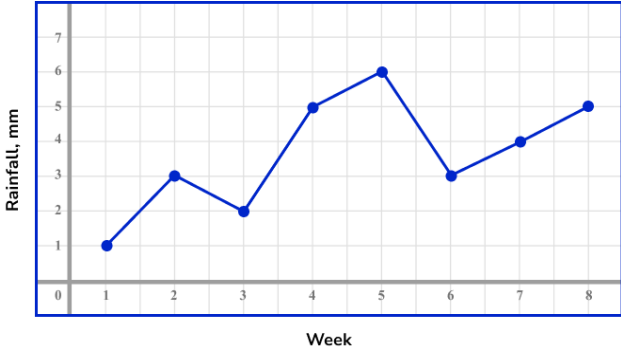



1.

2.

.....  
(2 marks)

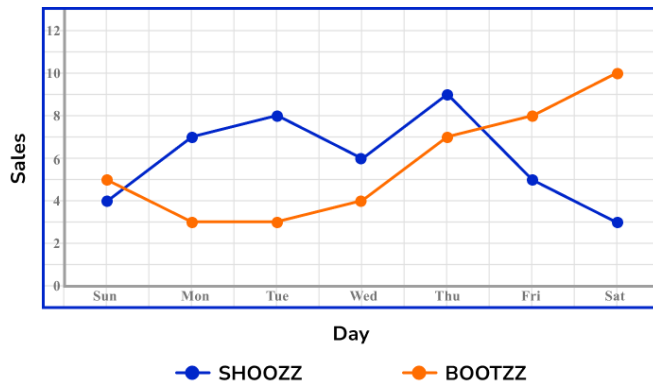
# Time Series Graphs - Answers

	Question	Answer
	Skill Questions	
Group A	<p>Find the required information from the time series graphs:</p> <p><b>1)</b> The time series graph shows information about the rainfall, in <i>mm</i>, in a garden over the period of 8 weeks.</p>  <p>a. Which week has the highest rainfall?</p> <p>b. What is the range of the amounts of rainfall over the 8 week period?</p> <p><b>2)</b> The time series graph shows the average temperature recorded in a city in quarter year periods over the years 2020 and 2021.</p>  <p>a. What is the difference between the temperatures in Q2 of 2020 and Q2 of 2021?</p> <p>b. What was the highest average temperature?</p>	<p><b>1)</b></p> <p>a. 5</p> <p>b. 5mm</p> <p><b>2)</b></p> <p>a. 3°C</p> <p>b. 15°C</p>

## Time Series Graphs - Answers

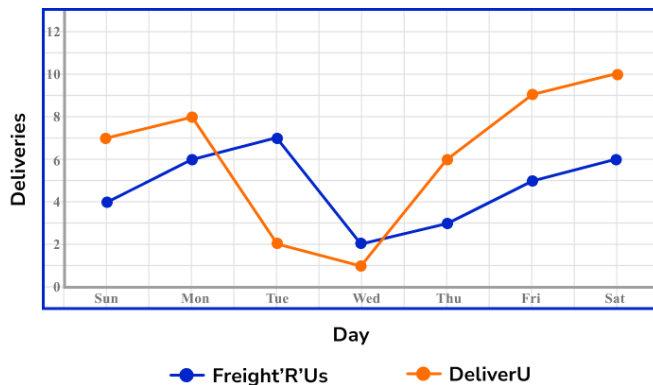
Group A  
contd

**3)** The time series graph shows the sales of flip flops sold in two different shoe shops, SHOOZZ and BOOTZZ over the period of one week.



- Which shoe shop sold the most flip flops that week?
- On what day were the sales in SHOOZZ 4 more than the sales in BOOTZZ?

**4)** The time series graph shows the number of parcel deliveries made by 2 different delivery companies during one week.



- What is the difference between the total deliveries made by each company that week?
- Which company delivered the most parcels that week?

**3)**

- SHOOZZ = 42  
BOOTZZ = 40  
SHOOZZ sold the most
- Monday

**4)**

- Freight'R'Us = 33  
DeliverU = 43  
 $43 - 33 = 10$
- DeliverU

## Time Series Graphs - Answers

**Group B** Use the data provided to draw time series graphs on graph paper:

**1)** The table shows information about the average temperature recorded in a city in quarter year periods over the years 2018 and 2019. Draw a time series graph for the data.

Year	2018				2019			
Quarter	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Temp, °C	9	10	17	14	5	13	20	16

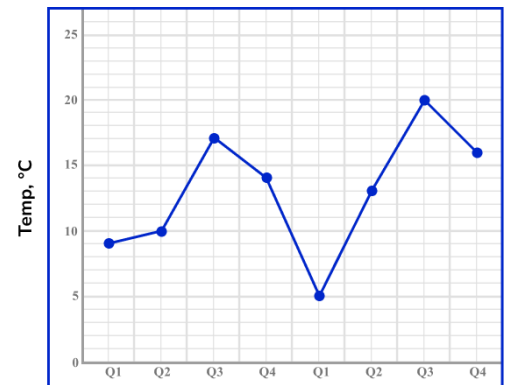
**2)** The table shows information about the rainfall measured in a garden over an 8 week period. Draw a time series graph for the data.

Week	1	2	3	4	5	6	7	8
Rainfall, mm	50	45	42	46	52	60	59	48

**3)** The table shows information about the sales, in thousands, of a company each month for a year. Draw a time series graph for the data.

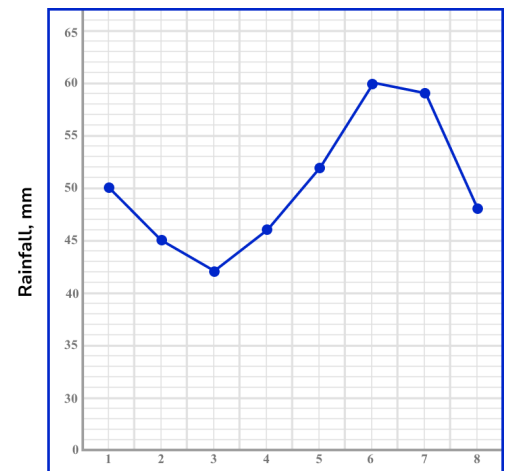
Month	J	F	M	A	M	J	J	A	S	O	N	D
Sales (1000s)	4.8	3.6	2.2	5.4	6	7.2	6.6	5.8	4.6	6.4	7.8	8.2

**1)**



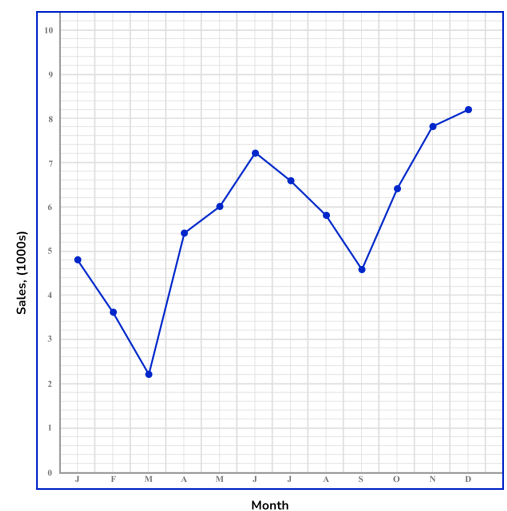
Quarters of 2018 and 2019

**2)**



Week

**3)**



Month



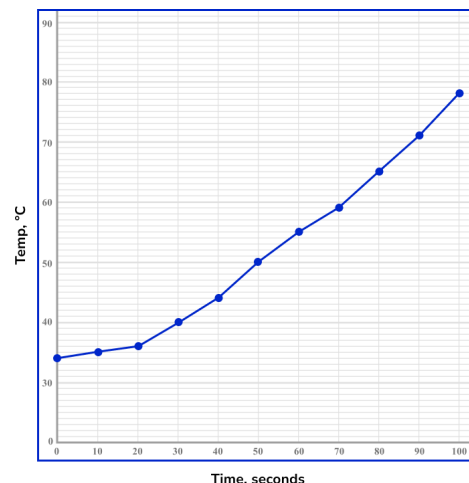
# Time Series Graphs - Answers

Group B  
contd

4) The table shows information about the temperature of soup being heated on a hob. Draw a time series graph for the data.

Time, s	0	10	20	30	40	50	60	70	80	90	100
Temp, °C	34	36	37	40	44	50	55	59	65	71	78

4)

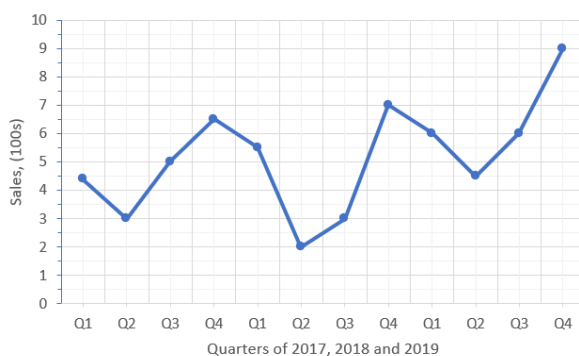


Group C

Answer the questions and describe the trend of each time series graph:

1) The table and time series graph show information about the sales, in hundreds, of a company over a 3 year period. By looking at the sales in Q1 for 2017, 2018 and 2019 and then looking at the sales in the Q2s, Q3s and Q4s, describe the trend on the sales of the company for the 3 year period

	2017				2018				2019			
Quarter	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Sales(100s)	4.4	3	5	6.5	5.5	2	3	7	6	4.5	6	9



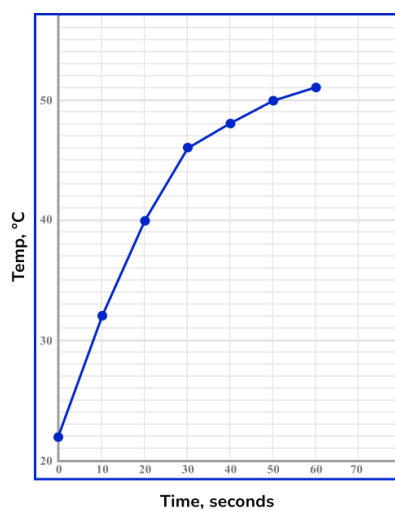
1) Increasing

# Time Series Graphs - Answers

Group C

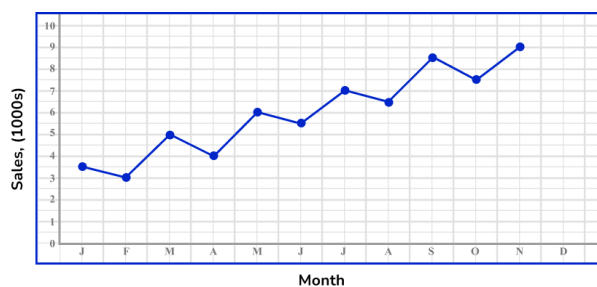
2) The table and time series graph show the temperature of a liquid being heated over a flame. By continuing the shape of the time series graph, predict the temperature of the liquid after 70 seconds.

Time, s	0	10	20	30	40	50	60
Temp, °C	22	32	40	46	48	50	51

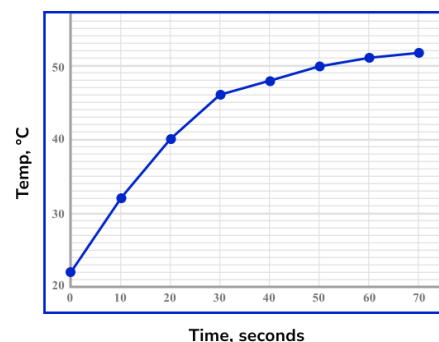


3) The table and time series graph show the sales, in thousands, of a company between January and November. Use a line of best fit to predict the sales in December.

Month	J	F	M	A	M	J	J	A	S	O	N	D
Sales (1000s)	3.5	3	5	4	6	5.5	7	6.5	8.5	7.5	9	



2)



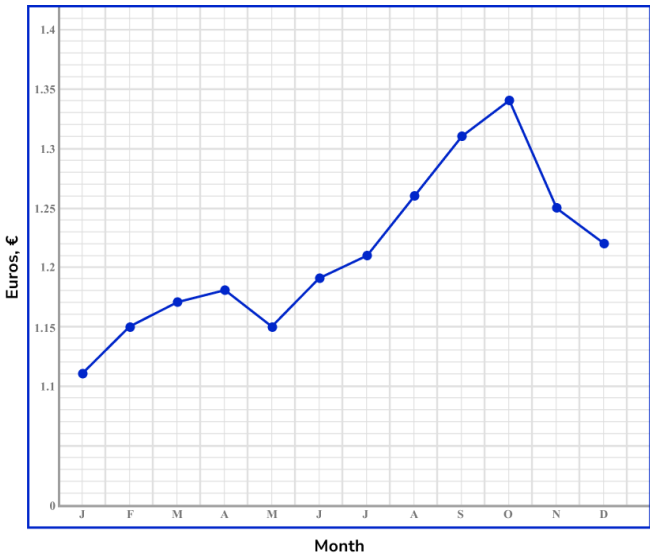
Approximately 51.5°C

3)



Approximately 9000

# Time Series Graphs - Answers

	Question	Answer
	Applied Questions	
1)	<p>The time series graph shows information about the exchange rate value of the Euro for one pound sterling over the period of a year.</p>  <p><b>a)</b> Describe the trend of the data between January and October.</p> <p><b>b)</b> Would it be suitable to use the trend of the data to make a prediction about the value of the Euro in January of the following year?</p>	<p><b>a)</b> Value of the Euro is increasing.</p> <p><b>b)</b> No, the value drops after October. Not suitable to extrapolate in this case.</p>

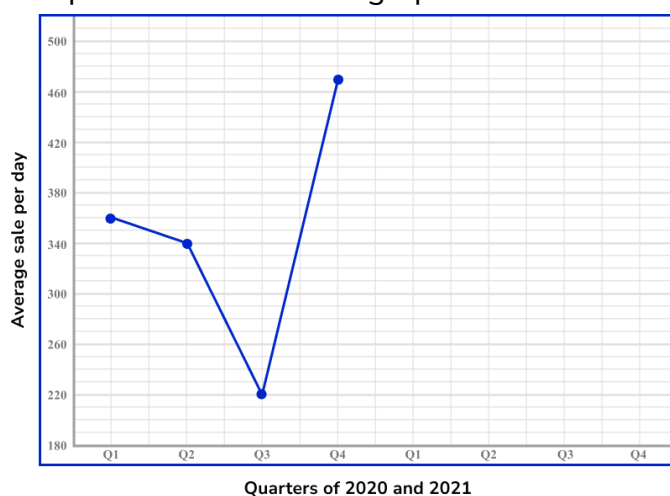
## Time Series Graphs - Answers

2)

The table shows information about the sales made by a shop over a 2 year period. The time series graph shows the data plotted for 2020.

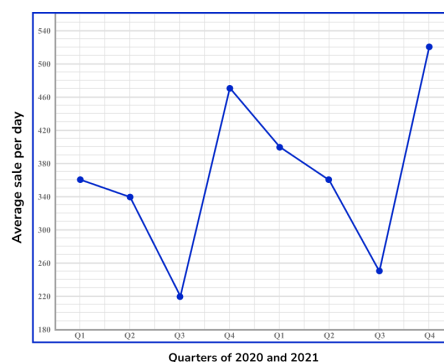
Year	2020				2021			
Quarter	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Average sales per day	360	340	220	470	400	360	250	520

a) Complete the time series graph for 2021.



b) By looking at the table and the time series graph, describe how the shop has performed over the 2 years.

a)

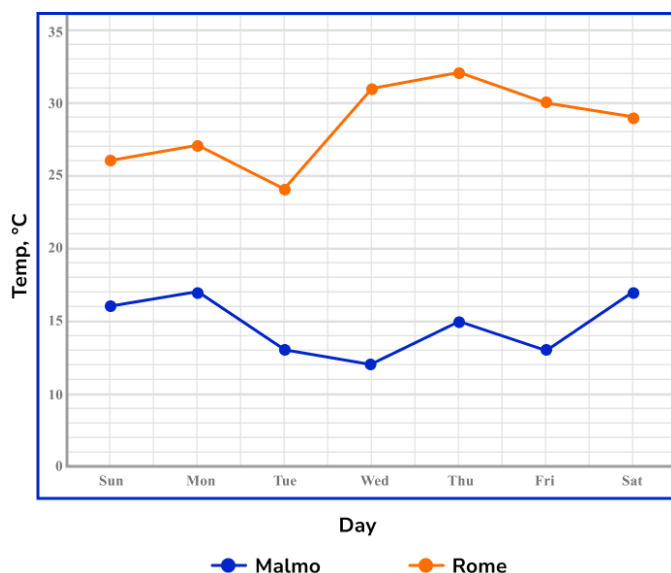


b) The shop's sales have increased.

## Time Series Graphs - Answers

**3)**

The time series graph shows the maximum temperatures reached during a week in Malmo and Rome.



**a)** On which day was the biggest difference in the temperatures of the two cities?

**b)** Use the data to find the mean temperatures of both cities for that week.

**a)** Wednesday

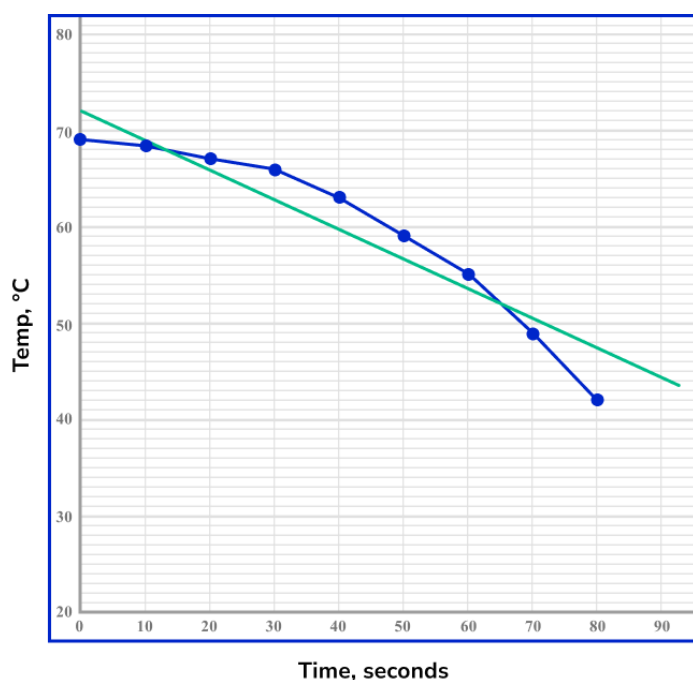
**b)** Malmo mean temp =  $14.7^{\circ}\text{C}$   
Rome mean temp =  $28.4^{\circ}\text{C}$

## Time Series Graphs - Answers

4)

John did an experiment where he had to measure the temperature of a liquid every 10 seconds for 80 seconds. He recorded his data in a table and plotted a time series graph.

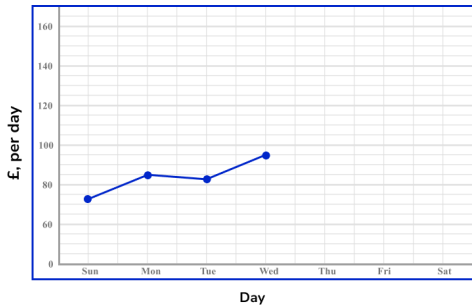
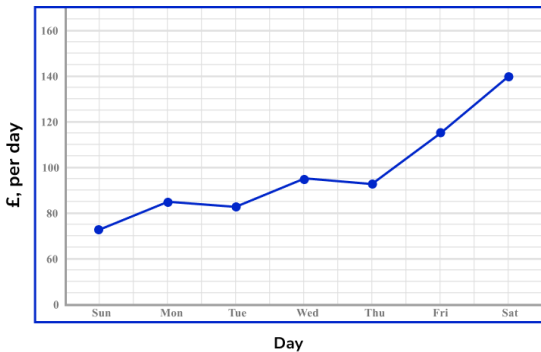
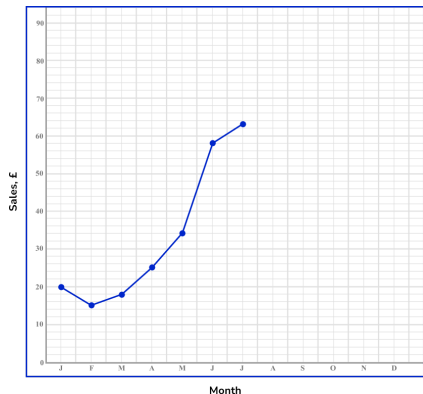
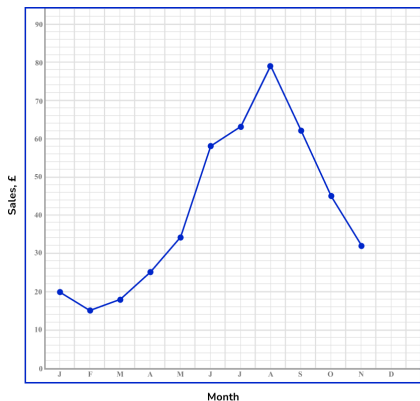
Time, s	0	10	20	30	40	50	60	70	80
Temp, °C	69	68.5	67	66	63	59	55	49	42



- a)** John wanted to predict the temperature of the liquid after 90 seconds. He used a line of best fit. Explain why this was not the correct method to use.
- b)** Use the table or time series graph to make a better prediction of the temperature after 90 seconds.

- a)** The data does not lie close to a straight line but shows a curve. A straight line of best fit is not suitable.
- b)** Approximately 33°C

# Time Series Graphs - Mark Scheme

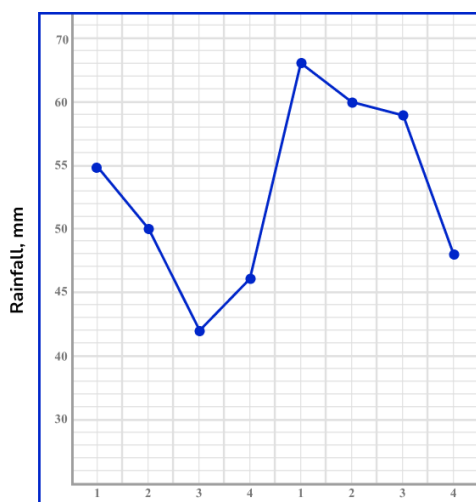
	Question	Answer																										
	Exam Questions																											
1)	<p>The table shows the amount of money a taxi driver earned during one week.</p> <table border="1"><thead><tr><th>Day</th><th>Sun</th><th>Mon</th><th>Tue</th><th>Wed</th><th>Thu</th><th>Fri</th><th>Sat</th></tr></thead><tbody><tr><td>£, per day</td><td>73</td><td>86</td><td>82</td><td>95</td><td>92</td><td>115</td><td>140</td></tr></tbody></table> <p>(a) Complete the time series graph for Thursday to Saturday.</p> 	Day	Sun	Mon	Tue	Wed	Thu	Fri	Sat	£, per day	73	86	82	95	92	115	140	<p>(a)</p>  <p>Points plotted correctly (1) Points joined with straight lines (1)</p>										
Day	Sun	Mon	Tue	Wed	Thu	Fri	Sat																					
£, per day	73	86	82	95	92	115	140																					
(b)	Describe the trend of the data.	(b) Increasing (1)																										
2)	<p>The table shows the average daily sales of an ice cream van over the period of a year.</p> <table border="1"><thead><tr><th>Month</th><th>J</th><th>F</th><th>M</th><th>A</th><th>M</th><th>J</th><th>J</th><th>A</th><th>S</th><th>O</th><th>N</th><th>D</th></tr></thead><tbody><tr><td>Sales, £</td><td>20</td><td>15</td><td>17</td><td>25</td><td>34</td><td>58</td><td>63</td><td>79</td><td>62</td><td>43</td><td>32</td><td></td></tr></tbody></table> <p>(a)</p> 	Month	J	F	M	A	M	J	J	A	S	O	N	D	Sales, £	20	15	17	25	34	58	63	79	62	43	32		<p>(a)</p>  <p>Points plotted correctly (1) Points joined with straight lines (1)</p>
Month	J	F	M	A	M	J	J	A	S	O	N	D																
Sales, £	20	15	17	25	34	58	63	79	62	43	32																	
(b)	Use the trend of the data between August and November to predict the value for December.	(b) Value between 24 and 28 (1)																										

## Time Series Graphs - Mark Scheme

3)

Below is a time series graph showing the amount of rainfall.

State the three mistakes that have been made with the time series graph.



1.

Scale on the y-axis not correct, gaps not consistent

(1)

2.

Horizontal axes not labelled, so not clear what the 1,2,3,4 represent

(1)

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