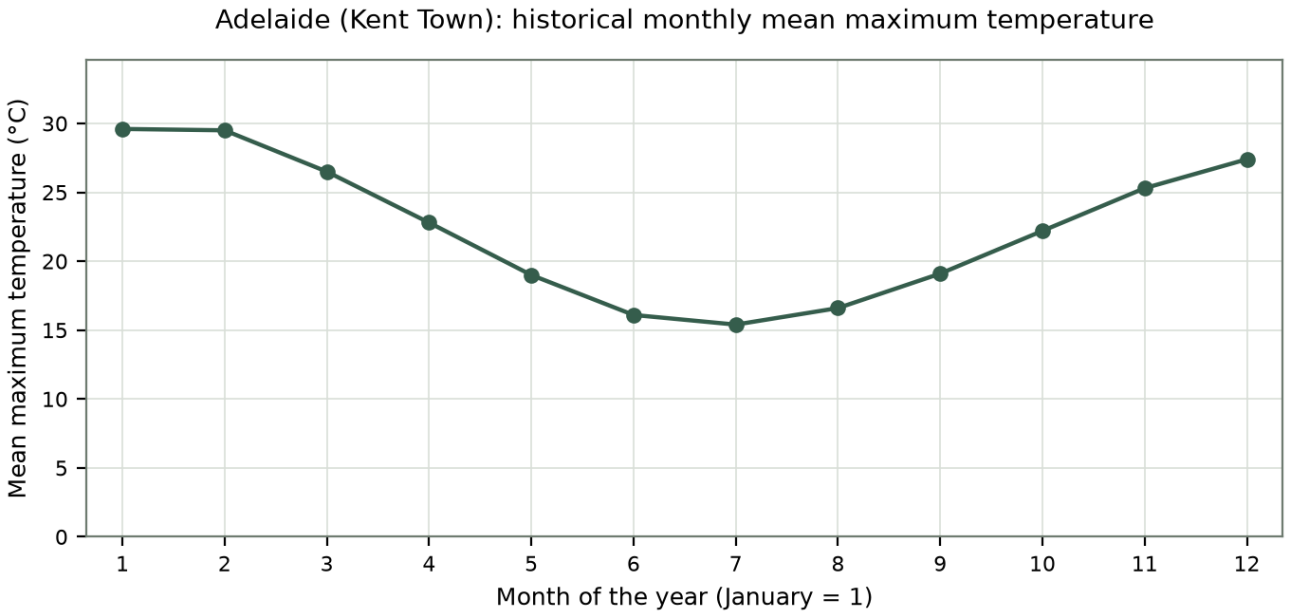
Read relationships in real-world graphs

8 questions | 20 marks

Equivalent correct methods and notation earn corresponding marks. Include units and directions where asked. Each worked step identifies the mark allocation.



Bureau of Meteorology, Adelaide (Kent Town), station 023090; all-years mean maximum temperature, 1977-2020 (44 years of available temperature data).

Month number	Month	Mean maximum temperature (°C)
1	January	29.6
2	February	29.5
3	March	26.5
4	April	22.8
5	May	19.0
6	June	16.1
7	July	15.4
8	August	16.6
9	September	19.1
10	October	22.2
11	November	25.3
12	December	27.4

Historical monthly averages across 1977-2020, not a daily weather record or forecast. Use the table for published values to one decimal place.

1. Use the included Adelaide (Kent Town) climate graph and table. Name the horizontal variable and the vertical variable, including the vertical unit. [2 marks]

Read the horizontal label and month numbering. Award 1 mark for month of the year.

Read the vertical label. Award 1 mark for mean maximum temperature with degrees Celsius.

Answer: Horizontal: month of the year, numbered January 1 to December 12. Vertical: mean maximum temperature, in degrees Celsius ($^\circ$C).

2. Use the included Adelaide (Kent Town) table to state the month and monthly mean maximum temperature at [2 marks]

(a) month 4

(b) month 11.

Month 4 is April; its row gives 22.8°C. Award 1 mark for both.

Month 11 is November; its row gives 25.3°C. Award 1 mark for both.

Answer:

(a) April, 22.8°C.

(b) November, 25.3°C.

3. Use the included Adelaide (Kent Town) graph and table. Identify the highest and lowest monthly mean maximum temperatures and their months. Find the difference between these two values. [3 marks]

Locate the highest plotted point and confirm January 29.6 in the table. Award 1 mark for the month and value.

Locate the lowest plotted point and confirm July 15.4 in the table. Award 1 mark for the month and value.

Calculate $29.6 - 15.4 = 14.2^\circ$C. Award 1 mark for the difference with units.

Answer: Highest: January, 29.6°C. Lowest: July, 15.4°C. Difference: 14.2°C.

4. Use the included Adelaide (Kent Town) graph and table. Describe the relationship between month and mean maximum temperature [4 marks]

(a) from January to July

(b) from July to December. Include the first and last values for each interval.

Follow the points from January to July. Award 1 mark for decreasing and 1 mark for the correct first and last values.

Follow the points from July to December. Award 1 mark for increasing and 1 mark for the correct first and last values.

Answer:

(a) As the months progress from January to July, the mean maximum temperature decreases from 29.6°C to 15.4°C.

(b) From July to December it increases from 15.4°C to 27.4°C.

5. March's mean maximum temperature is 26.5°C and October's is 22.2°C. Which month has the higher value, and by how much? [2 marks]

Compare 26.5 with 22.2: March's value is higher. Award 1 mark.

Subtract $26.5 - 22.2 = 4.3$°C. Award 1 mark for the difference with units.

Answer: March has the higher mean maximum temperature, by 4.3°C.

6. The monthly mean maximum temperatures are July 15.4°C, August 16.6°C and September 19.1°C. Calculate each month-to-month increase. Which of these two intervals has the larger increase? [3 marks]

July to August: $16.6 - 15.4 = 1.2$°C. Award 1 mark.

August to September: $19.1 - 16.6 = 2.5$°C. Award 1 mark.

Compare 2.5 with 1.2 and select August-September. Award 1 mark. An increasing graph need not have equal increases.

Answer: July-August increases by 1.2°C; August-September increases by 2.5°C. August-September has the larger increase.

7. May's mean maximum temperature is 19.0°C and September's is 19.1°C. Their points look almost level on the graph. Are the published values equal? Explain using their difference. [2 marks]

The table gives 19.0 and 19.1, which are not equal. Award 1 mark for rejecting equality and identifying September as higher.

Calculate $19.1 - 19.0 = 0.1$°C. Award 1 mark. The table preserves a small difference that may be hard to see on the graph.

Answer: No. September's value is 0.1°C higher than May's.

8. The graph uses historical monthly averages for Adelaide (Kent Town), calculated across 1977-2020. Its July mean maximum is 15.4°C. A student says, 'This graph proves that the maximum temperature on 15 July 2027 will be exactly 15.4°C.' Is the claim justified? Explain what the plotted value actually represents. [2 marks]

Reject the exact-date prediction: monthly historical averages do not give the temperature of a particular future day. Award 1 mark.

Explain that the plotted value summarises July daily maximum temperatures across many years. Award 1 mark.

Answer: No. 15.4°C is the historical average of July daily maximum temperatures across the years of record; it is not a forecast for 15 July 2027.

Curriculum alignment

Australian Curriculum | 9.0 | AC9M7A04

Interpret a graph made from Bureau of Meteorology monthly climate statistics: identify variables, read values, describe increasing and decreasing intervals, compare changes, and distinguish historical averages from daily observations or forecasts.

Official curriculum source | Checked 2026-11-02