Unit test | Algebra

Year 7 Algebra - Practice Test 1

Name: _____ Date: _____

18 questions | 40 marks | Show your working.

1. Solve $x + 7 = 15$. [1 mark]

2. Solve $x - 6 = 9$. [1 mark]

3. Solve $3x = 18$. [1 mark]

4. Solve $\frac{x}{4} = 5$. [1 mark]

5. Solve $2x + 3 = 17$. Show your steps. Then put your answer back into the equation to check it. [3 marks]

6. Solve $3x - 4 = 20$. Show your steps. Then put your answer back into the equation to check it. [3 marks]

7. Find the value of $2r + s$ when $r = 4$ and $s = 3$. Show your working. [2 marks]

8. Find the value of $3(a + 2)$ when $a = 5$. Show your working. [2 marks]

9. Write an expression for each. [2 marks]

(a) Multiply x by 3, then subtract 7.

(b) Add t and 5, then divide the total by 2.

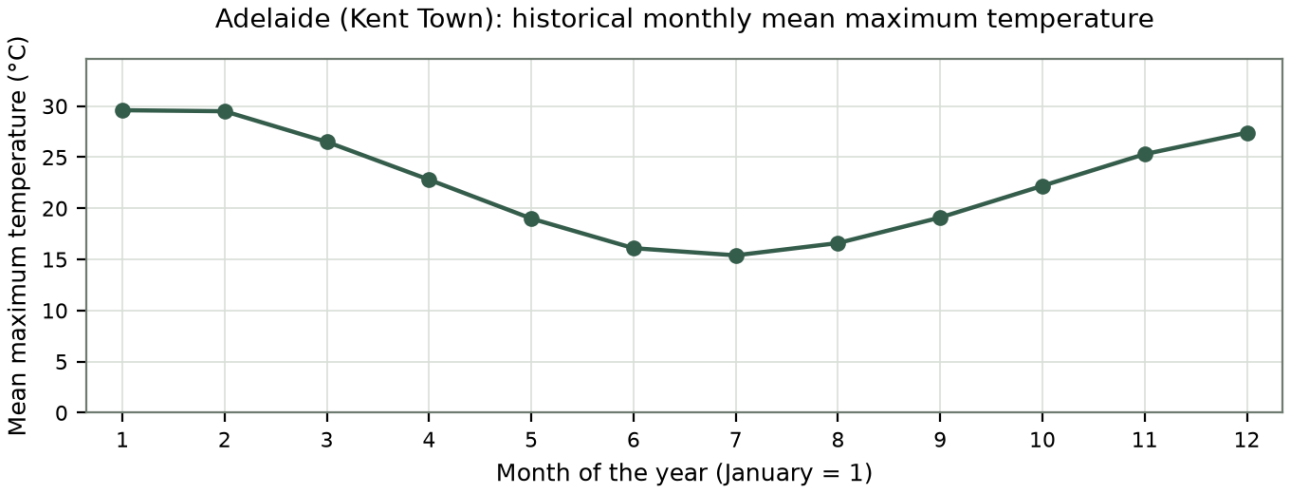
10. A notebook costs n dollars. A pen costs 3 dollars. Each set has one notebook and one pen. [3 marks]

(a) Write an expression for the cost of one set.

(b) Write an expression for the cost of 4 sets.

(c) Explain why both costs must be multiplied by 4.

11. A museum visit costs $C = 4n + 3$ dollars for n students. Find the cost for 6 students. Show your working. [2 marks]



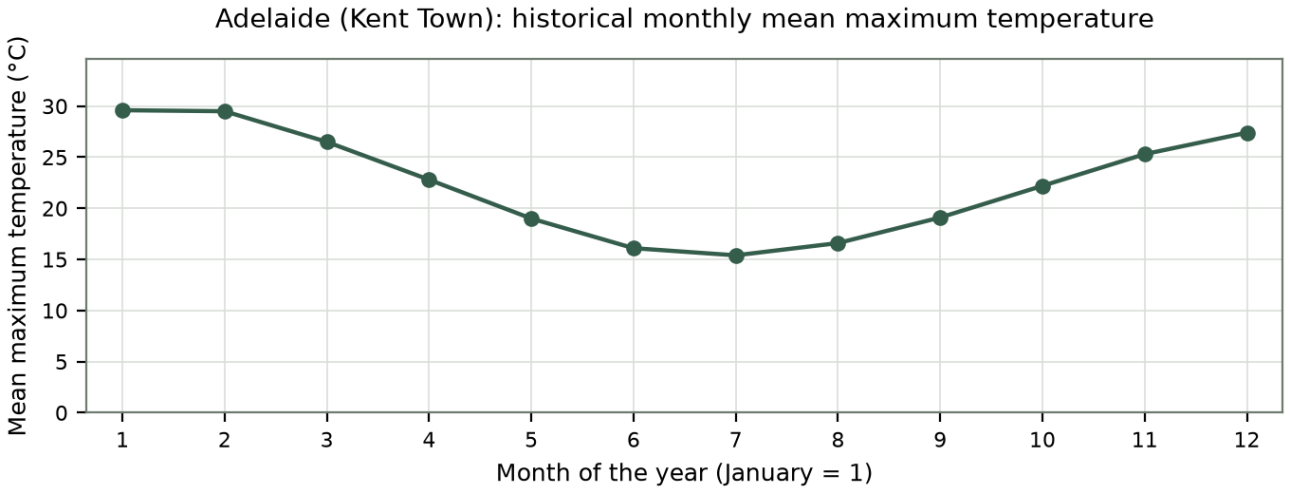
Bureau of Meteorology | Adelaide (Kent Town), station 023090 | Historical monthly mean maximums, 1977-2020.

12. Use the graph. Some values are January 29.6 °C, April 22.8 °C, July 15.4 °C and October 22.2 °C. [3 marks]

(a) What does the horizontal axis show?

(b) What does the vertical axis show? Include the unit.

(c) Which month has the lowest value? Give its temperature.



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13. Use the same graph. [3 marks]

(a) Does the temperature rise or fall from January to July? What about July to October?

(b) Find the drop from January to July. Show your working.

(c) Can this graph tell you the highest temperature on one day next July? Explain why or why not.

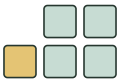
14. The tile pattern is shown below. Let n be the stage number and T the number of tiles. [3 marks]

Stage 1



3 tiles

Stage 2



5 tiles

Stage 3



7 tiles

(a) Fill the gaps: $n: 1, 2, 3, 4$; $T: 3, \square, \square, \square$.

(b) Write a rule linking T and n.

(c) How many tiles are at stage 12? Use your rule.

15. Use the grid to plot $T = 2n + 1$ for $n = 1, 2, 3, 4$. Label the horizontal axis n (stage) and the vertical axis T (tiles). Number both axes clearly. Plot four separate points. Do not join them. [2 marks]

16. A shop sells ribbon using the rule $C = 2l + 1$. Here l is the length in metres and C is the cost in dollars, including a fixed fee. You may buy part of a metre. [4 marks]

(a) Make a table of C for $l = 0, 1, 2, 3, 4$.

(b) Plot the points on the grid. Label and number both axes, then use a ruler to join the points with a straight line.

(c) Use your graph to find the cost of 2.5 metres.

17. The cost formula is $C = pn + f$. Here p is the price of one item, n is the number of items and f is a fee paid once. All costs are in dollars. Use $p = 4$ and $f = 3$. [2 marks]

(a) Find C for $n = 1, 2, 3$. Make a table with columns n, p, f, C.

(b) How much does the cost rise for each extra item? Explain why.

18. Use $C = pn + f$, with $n = 3$ and $f = 2$. [2 marks]

(a) Find the cost when $p = 2$ and when $p = 4$. Show your working.

(b) How much does the cost rise? Explain why.