Unit test | Algebra

Year 7 Algebra - Practice Test 3

Name: _____ Date: _____

18 questions | 40 marks | Show your working.

1. Solve $x + 9 = 21$. [1 mark]

2. Solve $x - 8 = 14$. [1 mark]

3. Solve $5x = 35$. [1 mark]

4. Solve $\frac{x}{6} = 4$. [1 mark]

5. Solve $4x + 3 = 31$. Show your steps. Check by putting your answer back into the equation. [3 marks]

6. Solve $3x - 5 = 22$. Show your steps. Check by putting your answer back into the equation. [3 marks]

7. Find $3a + 2b$ when $a = 2$ and $b = 5$. Show your working. [2 marks]

8. Find $4(t + 3)$ when $t = 2$. Show your working. [2 marks]

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

(a) Multiply k by 6, then add 2.

(b) Add m and 9, then divide the total by 3.

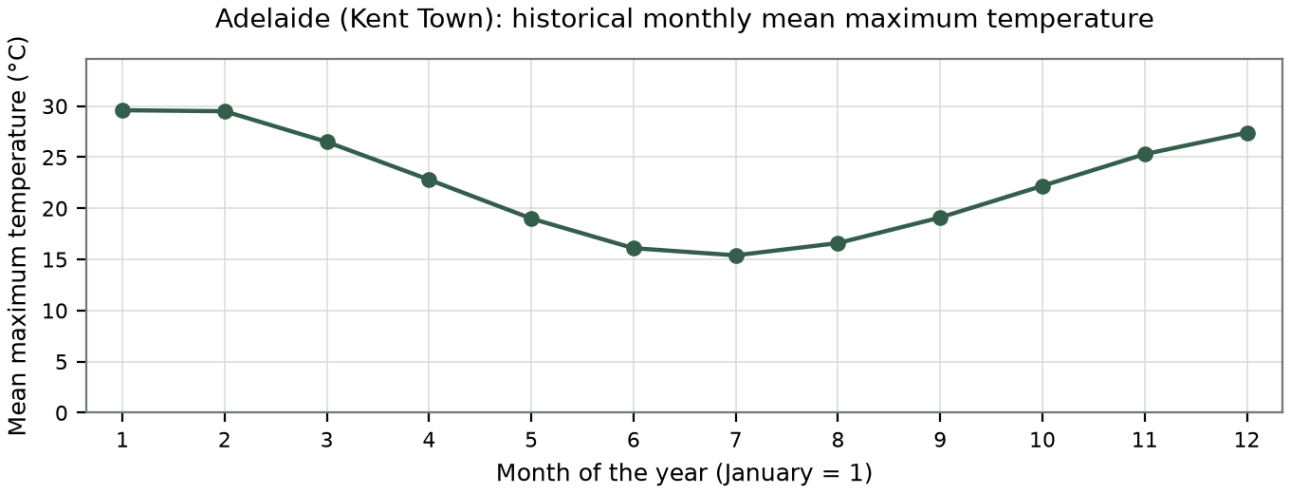
10. A ticket costs t dollars. A badge costs 2 dollars. Each pack has one ticket and one badge. [3 marks]

(a) Write the cost of one pack.

(b) Write the cost of 3 packs.

(c) Explain why both item costs must be multiplied by 3.

11. A swimming club charges 2 dollars per visit and a fee of 5 dollars paid once. The cost formula is $C = 2v + 5$, where v is the number of visits. Find the cost of 6 visits. Show your working. [2 marks]



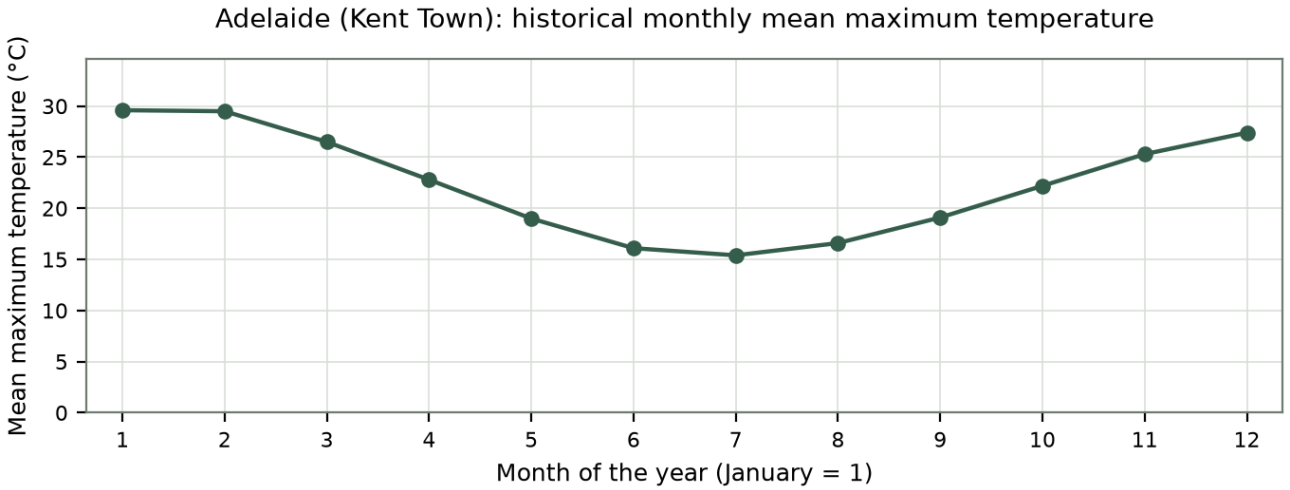
Bureau of Meteorology | Adelaide (Kent Town), station 023090 | Historical monthly mean maximums, 1977-2020.

12. Use the graph. Some values are February 29.5 °C, July 15.4 °C, November 25.3 °C and December 27.4 °C. [3 marks]

(a) What does the horizontal axis show?

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

(c) Look at July to December. Which month has the highest value? Give its temperature.



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13. Use the same graph. [3 marks]

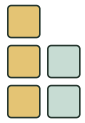
(a) Do the values rise or fall from February to July? What about July to November?

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

(c) Can the graph tell you the highest temperature on one day next July? Explain.

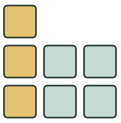
14. Stage 1 has 5 tiles. Each new stage adds 2 tiles. Let n be the stage number and T the number of tiles. [3 marks]

Stage 1



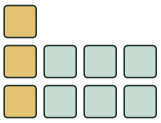
5 tiles

Stage 2



7 tiles

Stage 3



9 tiles

(a) Fill the gaps: $n: 1, 2, 3, 4$; $T: 5, \square, \square, \square$.

(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 $T = 2n + 3$ 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. Ribbon costs $C = 2l + 3$ dollars for l metres. You can buy any length, including part of a metre. [4 marks]

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

(b) Plot your table on the grid. Label both axes with units. Join the points with a straight line using a ruler.

(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 $p = 3$ and $f = 4$. [2 marks]

(a) Find C for $n = 1, 2, 3$. Make a table of n and C. Show one calculation.

(b) How much does each extra item add to the cost? Explain why.

18. Use $C = pn + f$, with $n = 4$ and $f = 1$. [2 marks]

(a) Find the cost when $p = 2$ and when $p = 5$. Show your working.

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