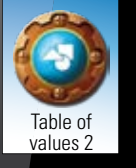


# Patterns and algebra



There are many ways to complete a pattern!

eg. Pattern	Rule
1, 2, 3, 4, 5, 6	Add 1
1, 2, 3, 4, 5, 6	$\times 2$ , $\times 2 - 1$ , $\times 2 - 2$ , $\times 2 - 3$
1, 2, 3, 5, 8, 13	Sum of last two numbers

1 Think of different ways to continue this number series. Add the missing rules and complete the patterns.

Rule	Pattern						
a Add 2	2	4					
b $\times 3 - 2$	2	4					
c	2	4					
d	2	4					

2 Continue these patterns.

a	<b>A</b>	2	2.5	3.5	5	7				
	<b>B</b>	2	3	5						
	<b>C</b>	2	5	11						
b	<b>X</b>	101	82	65	50					
	<b>Y</b>	1	4	9						
	<b>Z</b>	$\frac{1}{3}$	$\frac{2}{6}$	$\frac{3}{9}$						



3 Explain the patterns in question 2 by writing the rule you followed.

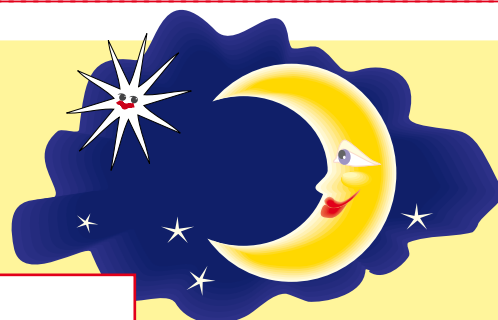
a A = \_\_\_\_\_  
 B = \_\_\_\_\_  
 C = \_\_\_\_\_

b X = \_\_\_\_\_  
 Y = \_\_\_\_\_  
 Z = \_\_\_\_\_

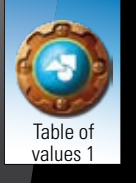


**Challenge!** What was special about the time and date on 20 February, 2002 at 2 minutes past eight in the evening?

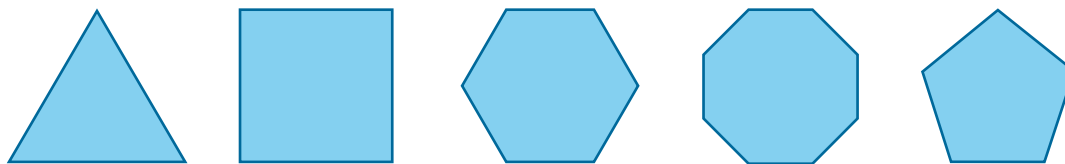
When will a similar time happen again?



# Make a table



1 a Complete the table to show the number of lines of symmetry in regular polygons.



Number of sides	3	4	5	6	8
Number of lines of symmetry					

b Write the rule for lines of symmetry and number of sides in a regular polygon.

c How many lines of symmetry in a fifteen-sided regular polygon? \_\_\_\_\_

2 a Complete the table to show the perimeters of joined 3 cm squares.



Joined squares	1	2	3	4	5	6
Perimeter						

b Write the rule for the perimeters of joined squares.

c What would be the perimeter of twelve joined squares? \_\_\_\_\_

3 a Complete the table to show the perimeters of joined 3 cm equilateral triangles.



Joined triangles	1	2	3	4	5	6	7	8
Perimeter								

b Write the rule. \_\_\_\_\_

## Draw a diagram

Draw a diagram and make a table to show the perimeters of joined 2 cm octagons.

