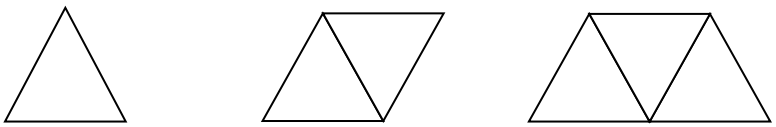
Patterns – The Lock

Solve each problem and use the solutions to unlock the code by substituting the answers into the unlocking code.

1) The sides of a bridge are constructed by joining sections. The sections are made of triangular steel girders.



1 section — 3 girders

2 sections — 5 girders

3 sections

Copy and complete the table below.

Number of sections, S	1	2	3	4		7
Number of girders, g	3					

The value you obtain for the number of girders when you have 7 sections is the value of *a*. Use this in the unlocking code.

a =

2) A joiner charges the following rates based on how long it takes to complete a job.

Length of job (hrs), h	1	2	3	4		8
Cost of job (£), C	35	55	75			

Complete the table and construct a formula for the cost of a job, *C*, when you know the number of hours, *h*, it will take.

Using the formula, find the cost of a job which lasts 10 hours. The value you obtain is the value of *b*. Use this in the unlocking code.

b =

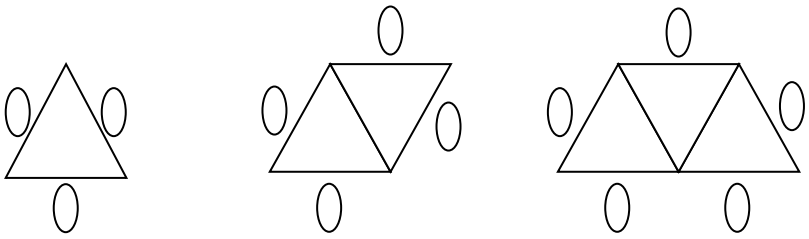
3) The cost of a taxi journey is given in the table below.

No. of miles, m	1	2	3	4		9
Cost of journey (£), C	8	11	14			

Write a formula for the cost, *C*, of a taxi journey when you know the number of miles, *m*. How much does it cost for 11 miles? The value you obtain is the value of *c*. Use this in the unlocking code.

c =

4) This pattern is made from triangular tables.



1 table
3 people

2 tables
4 people

3 tables
5 people

No. of tables, T	1	2	3	4		7
No. of people, P	3					

Complete the table and construct a formula for the no. of people, *P*, when you know the number of tables, *T*, that customers need.
How many people can be seated if you have 15 tables? The value you obtain is the value of *d*. Use this in the unlocking code.

d =

5) The cost of hiring a lawnmower over a period of time is as follows:

No. of days, D	1	2	3	4		9
Cost (£), C	12	17	22			

Complete the table and construct a formula connecting the cost, *C,* of hiring a lawnmower and the number of days, *D*, it is hired for.
How much will it cost to hire a lawnmower for 11 days? The value you obtain is the value of *e*. Use this in the unlocking code.

e =

6) Below is a table showing the relationship between *x* and *y*.

x	1	2	3	4
y	5	6	7	8

Construct a formula connecting *x* and *y*. Calculate *y* when *x* = 8. The value you obtain is the value of *f*. Use this in the unlocking code.

f =

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$$\frac{10(2b + a - f) + e}{d + 1}$$

Answers:

a = 15

b = 215

c = 38

d = 17

e = 62

f = 12

Code: 244