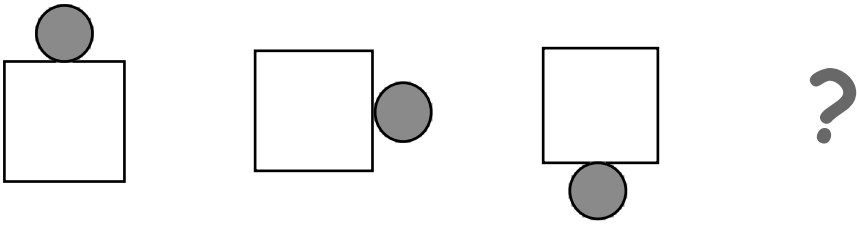


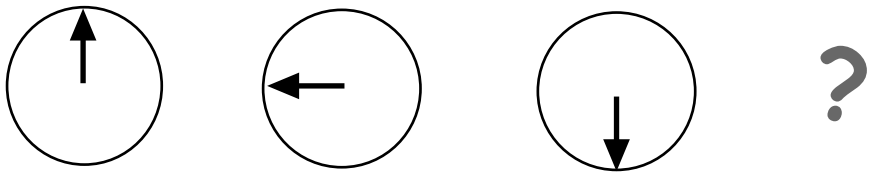
Chapter 15

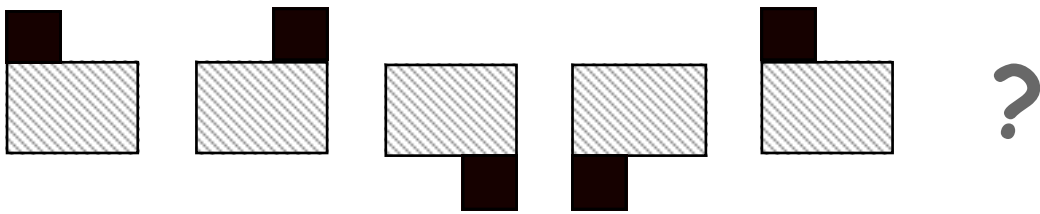
Patterns

Exercise 1

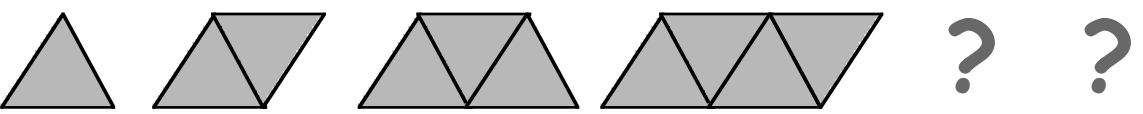
1. For each of the drawings below draw the next "bit" of the pattern.

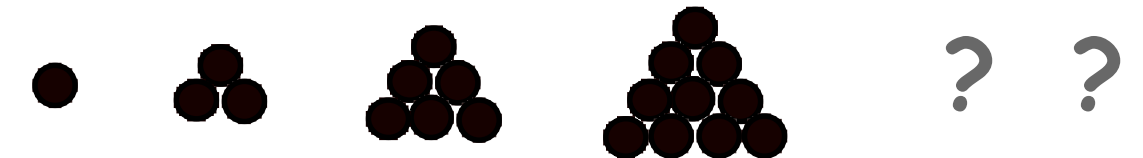
(a) 

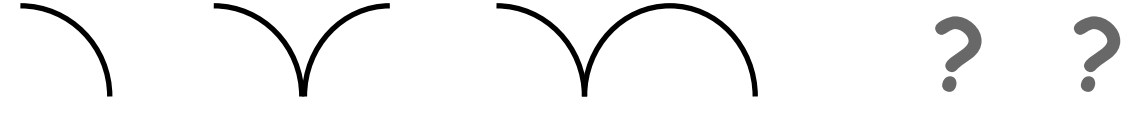
(b) 


(c) 

2. Show (neatly) the next 2 drawings in each of the following patterns.

(a) 

(b) 

(c) 

(d) 

3. Copy each pattern of letters and find the next letter in the pattern :-

- (a) A, C, E, G, I, ...
- (b) T, S, R, Q, ...
- (c) Y, V, S, P, M, ...
- (d) A, B, D, G, K, P, ...
- (e) A, Z, B, Y, C, X, D, ...
- (f) L, N, K, O, J, P, I, Q, ...

Exercise 2

1. Describe each of the following sequences by saying :-

"Begin at the number "...." and go up (down) by "...." each time.

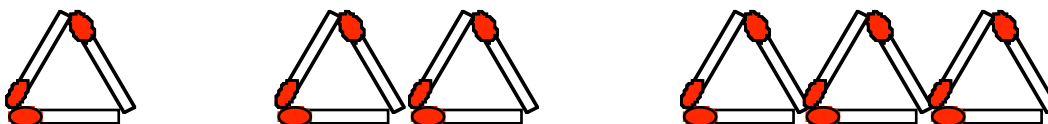
- (a) 4, 6, 8, 10, 12, ... (b) 1, 5, 9, 13, 17, ...
 (c) 42, 38, 34, 30, 26, ... (d) 1, 102, 203, 304, 405, ...
 (e) 5·7, 6·6, 7·5, 8·4, 9·3, ... (f) 8·5, 8·25, 8, 7·75, 7·5, ...

2. Write down the next two numbers in each sequence :-

- (a) 4, 6, 8, 10, 12, ... (b) 5, 10, 15, 20, 25, ...
 (c) 53, 47, 41, 35, ... (d) 12, 43, 74, 105, 136, ...
 (e) 1·4, 3·5, 5·6, 7·7, ... (f) 7·9, 6·7, 5·5, 4·3, 3·1, ...



3. Look at the pattern made with matches.



- (a) Draw the pattern showing the matches needed for 4 triangles.
 (b) The pattern for the number of matches needed is 3, 6, 9, 12.
 Copy this sequence and fill in the next 3 numbers.
 (c) Copy the following and complete :-
 "Start with 3 matches for 1 triangle and
 add on ... matches for each extra triangle".
 (d) How many matches are needed for 10 triangles ?

4. Copy each Fibonacci sequence below and continue the pattern to 8 terms :-

- (a) 1, 1, 2, 3, 5, 8, ... (b) 4, 5, 9, 14, 23, ...
 (c) 10, 20, 30, 50, ... (d) 5, 6, ...

5. The sequence 3, 8, 15, 24, 35, ... can be written as

$(1 \times 3), (2 \times 4), (3 \times 5), (4 \times 6), \dots$

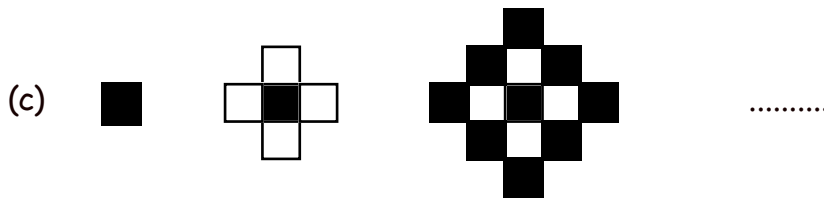
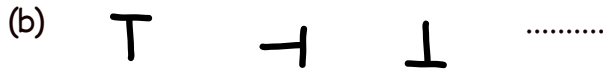
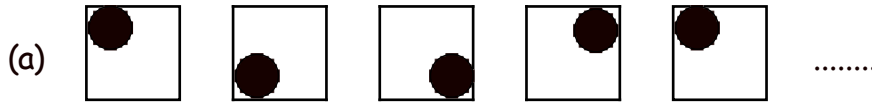
- (a) Write down the the next five numbers in this pattern.
 (b) Write down the calculation for the 100th term.
 (c) Write down the calculation for the 1432nd term.





Revision Exercise

1. Copy (neatly) each of these drawings and sketch the next pattern :-



2. Find the next three letters in each pattern :-

(a) B, E, H, K, N,

(b) z, x, v, t, r,

3. Describe each of the following pattern of numbers and write down the next two numbers each time :-

(a) 1, 3, 5, 7,

(b) 2, 4, 8, 16, 32,

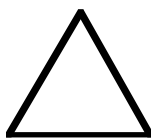
(c) 6, 9, 12, 15, 18,

(d) 128, 64, 32, 16,

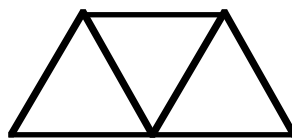
(e) 27, 24, 21, 18,

(f) 1, 1, 2, 3, 5, 8, 13,

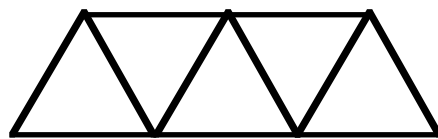
4. A metal bridge has one of its sides built with steel beams as follows :-



1 section
3 beams



2 section
7 beams



3 section
11 beams

(a) How many beams would be needed for 4 sections ?

(b) Copy and complete this table :-

No. sections	1	2	3	4	5	6
beams needed	3

(c) Describe carefully how the pattern is formed.

(d) Use your description to find how many beams are needed for 20 sections.