

UNIT 13 Searching for Pattern

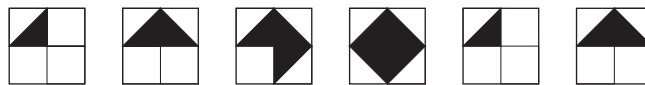
Extra Exercises 13.1

1. Consider this pattern of shapes:



- (a) Draw the 5th shape.
- (b) Draw the 10th shape.

2. Consider this pattern of shapes:



Draw:

- (a) the 7th shape,
- (b) the 10th shape,
- (c) the 16th shape,
- (d) the 99th shape.

3. Add the next 4 shapes to each of these patterns:

- (a)
- (b)
- (c)
- (d)
- (e)

4. Consider this pattern:



Draw:

- (a) the 10th shape,
- (b) the 11th shape,
- (c) the 27th shape,
- (c) the 48th shape.

UNIT 13 Searching for Pattern

Extra Exercises 13.2

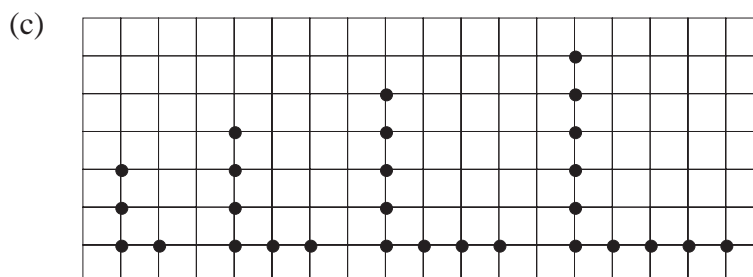
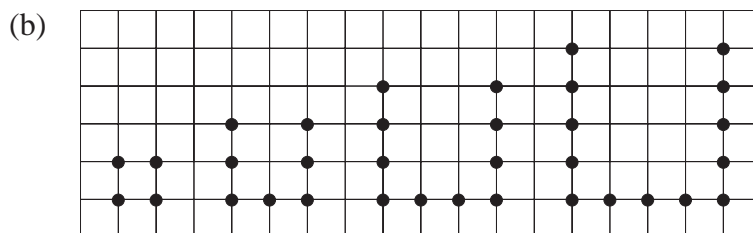
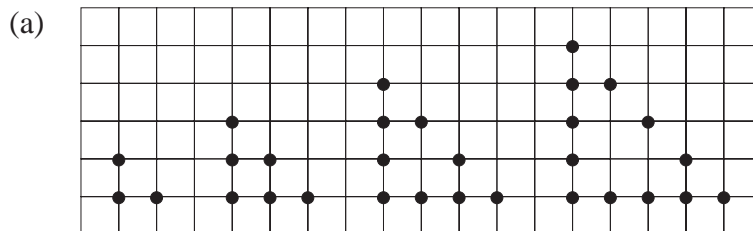
1. Write down the next four terms of each sequence:

- (a) 3, 7, 11, 15, 19, ...
- (b) 24, 22, 20, 18, 16, ...
- (c) 3, 4, 6, 9, 13, ...
- (d) 41, 40, 38, 35, 31, ...
- (e) 3, 4, 7, 11, 18, 29, ...

2. Write down:

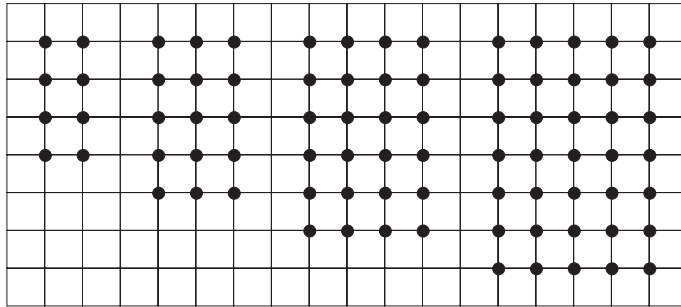
- (a) the 12th triangle number,
- (b) the 9th square number,
- (c) the 10th number in the Fibonacci sequence that begins 1, 1, 2, 3, 5, 8, ...

3. For each pattern below, draw the next two diagrams and find the number of dots in the 8th shape in each sequence:



Extra Exercises 13.2

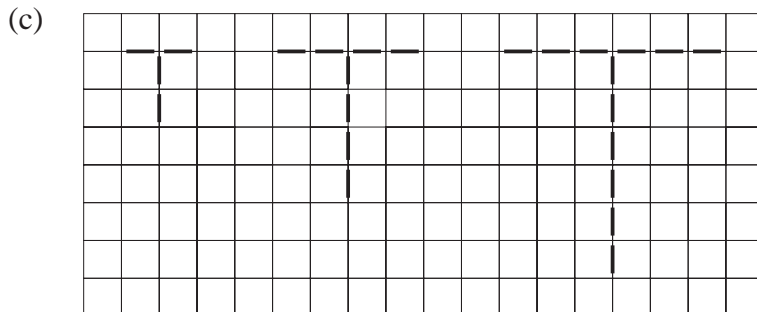
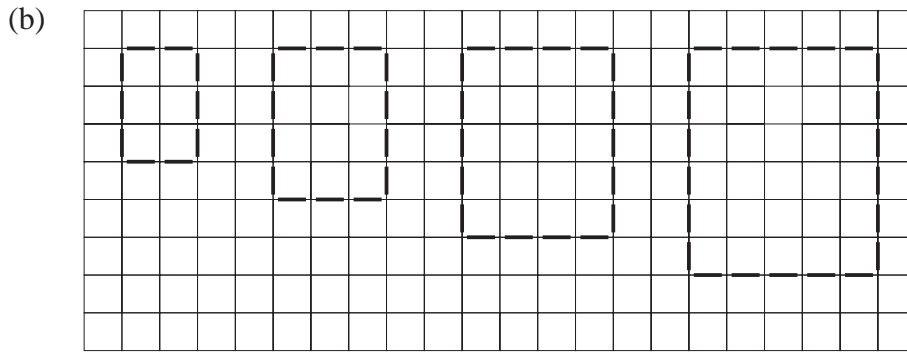
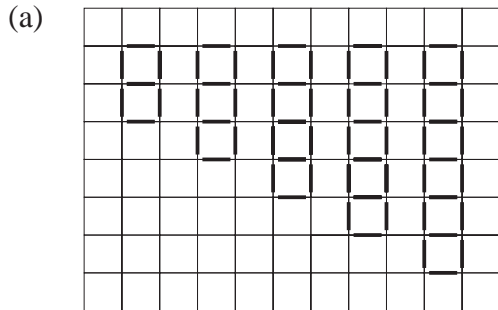
(d)



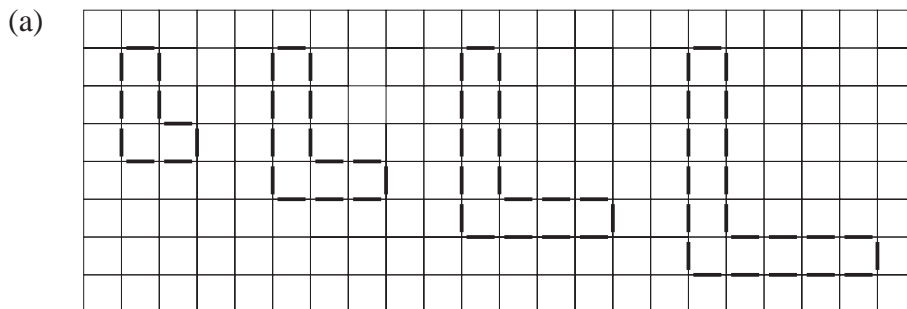
UNIT 13 *Searching for Pattern*

Extra Exercises 13.3

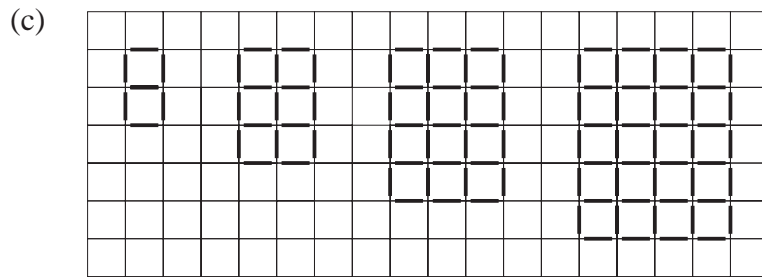
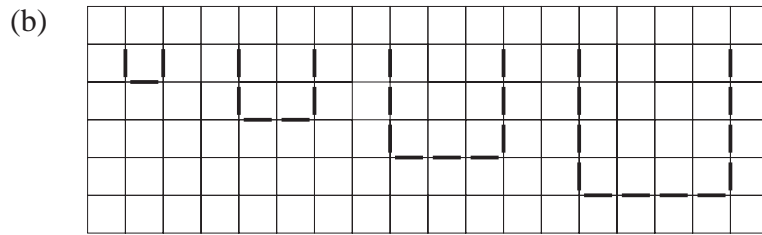
1. Draw the next 3 shapes in each pattern:



2. How many matchsticks would be needed to make the 6th shape in each of these patterns:



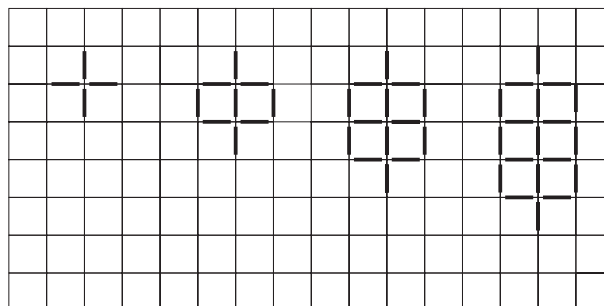
Extra Exercises 13.3



3. How many matchsticks are needed to make:

- (a) the 8th shape,
- (b) the 12th shape,
- (c) the n th shape

in this pattern:



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Extra Exercises 13.4

1. Write down the next 2 sets of numbers in this sequence:

0 , 0 1 , 0 1 2 , 0 1 2 3
 0 0 2 0 2 6
 0 0 12
 0

2. Write down the 6th set of numbers in this sequence:

2 , 2 4 , 2 4 6 , 2 4 6 8
 6 6 10 6 10 14
 16 16 24
 40

3. Here are the first 4 rows of a triangular pattern of numbers:

1
 2 2
 3 4 3
 4 7 7 4

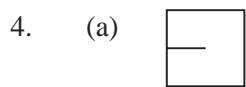
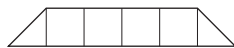
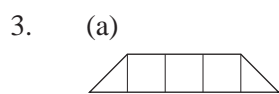
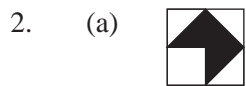
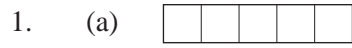
Write down the next 3 rows of the triangle.

4. Write down the next 3 sets of numbers in this sequence:

1 , 1 2 , 1 2 1 , 1 2 1 2 , 1 2 1 2 1
 3 3 3 3 3 3 3 3 3 3
 6 6 6 6 6 6
 2 2 2
 4

Extra Exercises 13.1

Answers

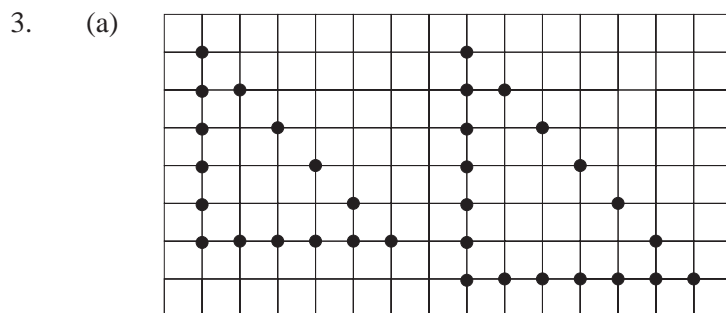


Extra Exercises 13.2

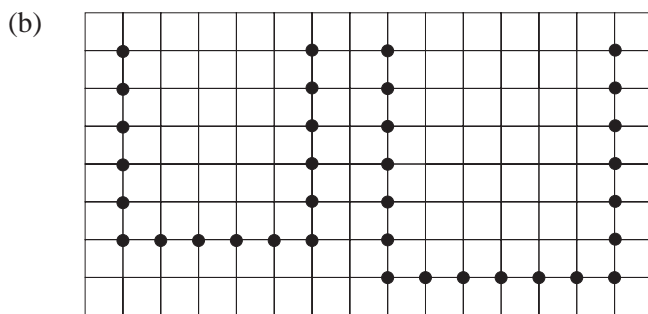
Answers

1. (a) 23, 27, 31, 35
- (b) 14, 12, 10, 8
- (c) 18, 24, 31, 39
- (d) 26, 20, 13, 5
- (e) 47, 76, 123, 199

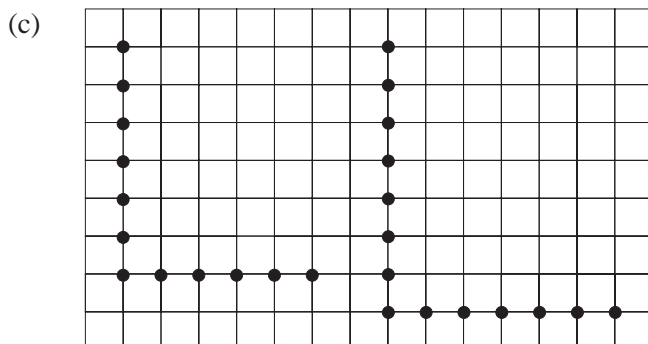
2. (a) 78
- (b) 81
- (c) 55



Sequence: 3, 6, 9, 12, 15, 18
 8th term = 24



Sequence: 4, 7, 10, 13, 16, 19
 8th term = 25

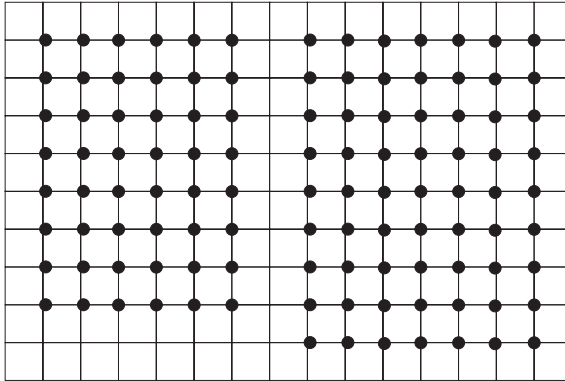


Sequence: 4, 6, 8, 10, 12, 14
 8th term = 18

Answers

Extra Exercises 13.2

(d)



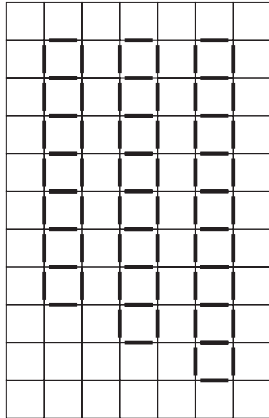
Sequence: 8, 15, 24, 35, 48, 63

8th term = 99

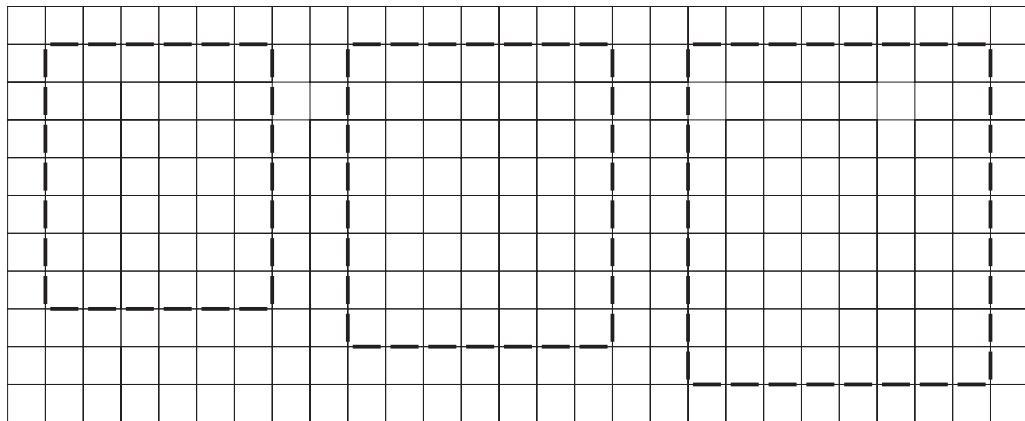
Extra Exercises 13.3

Answers

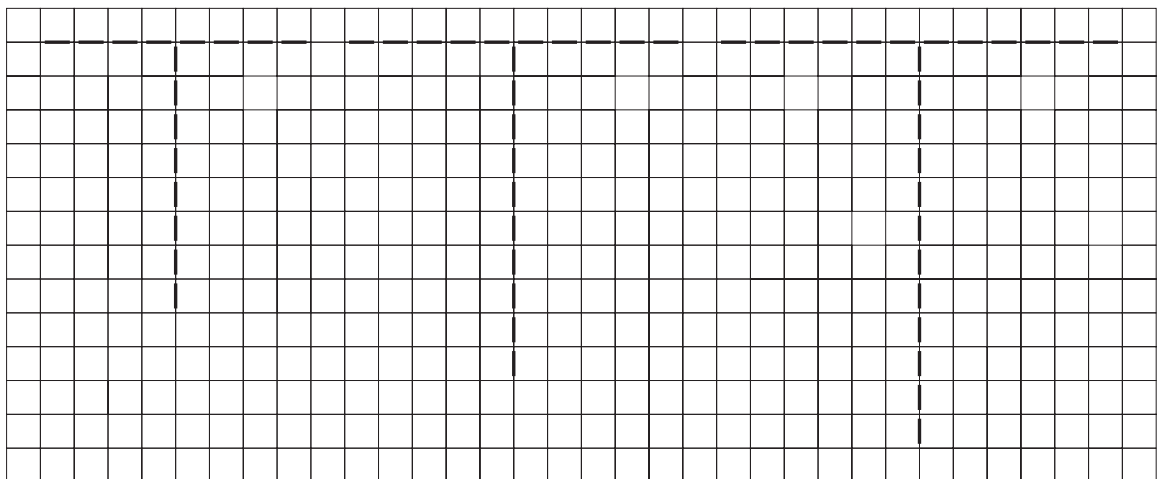
1. (a)



(b)



(c)



2. (a) 30 (b) 18 (c) 97

3. (a) 39 (b) 59 (c) $5n - 1$

Extra Exercises 13.4

Answers

1.
$$\begin{array}{cccccc}
 0 & 1 & 2 & 3 & 4 & \\
 & 0 & 2 & 6 & 12 & \\
 & & 0 & 12 & 72 & \\
 & & & 0 & 864 & \\
 & & & & 0 &
 \end{array}
 ,
 \begin{array}{cccccc}
 0 & 1 & 2 & 3 & 4 & 5 \\
 & 0 & 2 & 6 & 12 & 20 \\
 & & 0 & 12 & 72 & 240 \\
 & & & 0 & 864 & 17280 \\
 & & & & 0 & 14929920 \\
 & & & & & 0
 \end{array}$$

2.
$$\begin{array}{cccccc}
 2 & 4 & 6 & 8 & 10 & 12 \\
 & 6 & 10 & 14 & 18 & 22 \\
 & & 16 & 24 & 32 & 40 \\
 & & & 40 & 56 & 72 \\
 & & & & 96 & 128 \\
 & & & & & 224
 \end{array}$$

3.
$$\begin{array}{cccccc}
 & & & & & 1 \\
 & & & & & 2 & 2 \\
 & & & & & 3 & 4 & 3 \\
 & & & & & 4 & 7 & 7 & 4 \\
 & & & & & 5 & 11 & 14 & 11 & 5 \\
 & & & & & 6 & 16 & 25 & 25 & 16 & 6 \\
 & & & & & 7 & 22 & 41 & 50 & 41 & 22 & 7
 \end{array}$$

4.
$$\begin{array}{cccccc}
 1 & 2 & 1 & 2 & 1 & 2 & , & 1 & 2 & 1 & 2 & 1 & 2 & 1 & , & 1 & 2 & 1 & 2 & 1 & 2 & 1 & 2 \\
 3 & 3 & 3 & 3 & 3 & & & 3 & 3 & 3 & 3 & 3 & 3 & & & 3 & 3 & 3 & 3 & 3 & 3 & 3 \\
 6 & 6 & 6 & 6 & & & & 6 & 6 & 6 & 6 & 6 & & & & 6 & 6 & 6 & 6 & 6 & 6 \\
 2 & 2 & 2 & & & & & 2 & 2 & 2 & 2 & & & & & 2 & 2 & 2 & 2 & 2 \\
 4 & 4 & & & & & & 4 & 4 & 4 & & & & & & 4 & 4 & 4 & 4 \\
 8 & & & & & & & 8 & 8 & & & & & & & 8 & 8 & 8 \\
 & & & & & & & 6 & & & & & & & & 6 & 6 \\
 & & & & & & & & & & & & & & & 2
 \end{array}$$