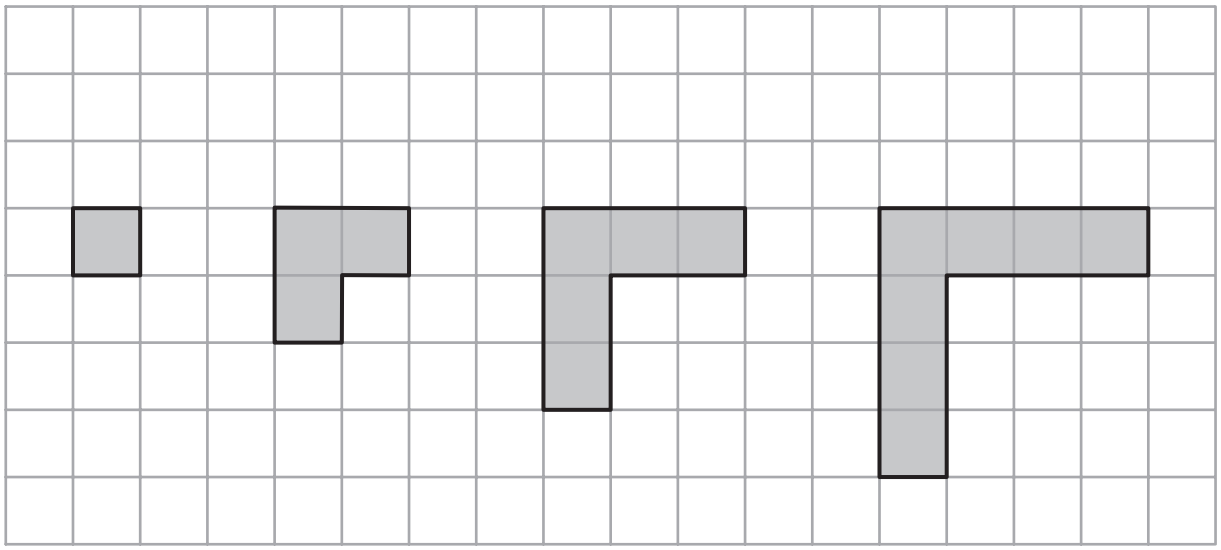
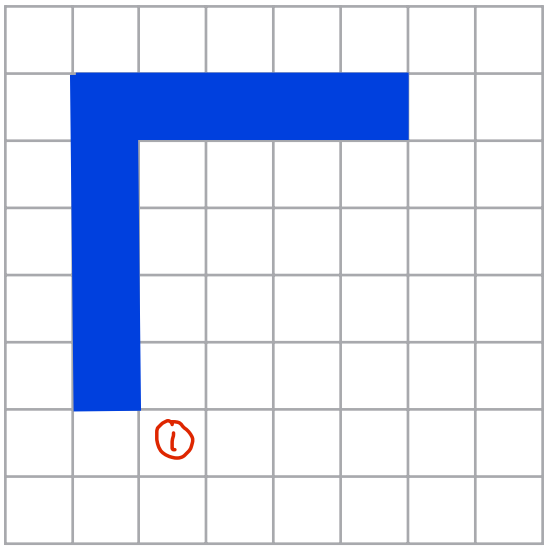
1 Here is a sequence of patterns made from grey square tiles.



Pattern number 1 | Pattern number 2 | Pattern number 3 | Pattern number 4

(a) On the grid below, draw Pattern number 5



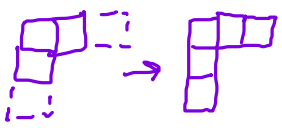
(1)

(b) Complete the table.

Pattern number	1	2	3	4	5	6
Number of squares	1	3	5	7	9	11

(1)

Each new pattern adds two squares to the 'ends' of the previous, e.g:



(Total for Question 1 is 2 marks)

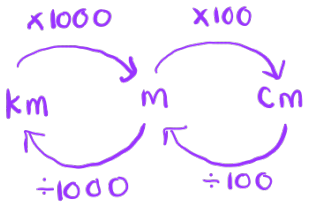
2 Aleksy is using a map.

The map has a scale of 1 : 25 000

On the map a road has a length of 6 cm.

(b) Work out the length, in kilometres, of the real road.

CONVERSION



1 cm : 25 000 cm

×6 ×6

6 cm : 150 000 cm (1)

$= \frac{150\,000 \text{ cm}}{100\,000 \frac{\text{cm}}{\text{km}}}$ (1)

$= 1.5$ km (1)

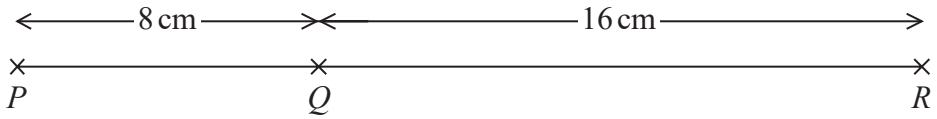
$$\begin{array}{r} {}^{3}25\,000 \\ \times \quad 6 \\ \hline 150\,000 \end{array}$$

1.5 ..... kilometres

(3)

(Total for Question 2 is 3 marks)

3 The diagram shows three motorway service stations P, Q and R on a map.



The map has a scale of 1 cm = 4 km.

Work out the real distance from P to R.

distance PR on map : $8 + 16 = 24$ cm (1)

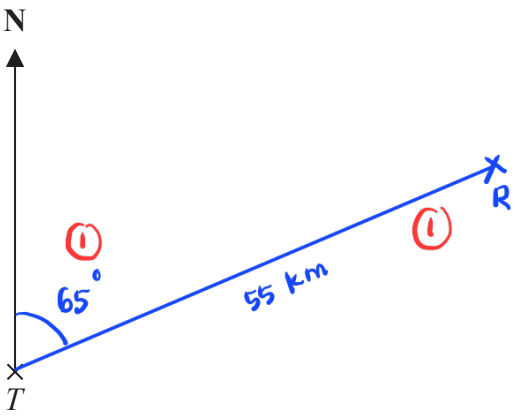
real distance : $24 \text{ cm} \times \frac{4 \text{ km}}{1 \text{ cm}}$ (1)

$= 96$ km (1)

96 km

(Total for Question 3 is 3 marks)

4 The diagram shows the position of town T.



55 km = 5 5cm

Town R is 55 km from town T on a bearing of 065°

Mark the position of town R with a cross (×).
Use a scale of 1 cm to 10 km.

(Total for Question 4 is 2 marks)

5 A map has a scale of 1 cm represents 4 km.

On the map, the distance from town A to town B is 8 cm.

(a) Work out the real distance, in km, from town A to town B.

1 cm : 4 km

8 cm : x km

$\frac{1}{8} = \frac{4}{x}$

$x = 4 \times 8$ (1) $= 32$ km

32 (1)

..... km

(2)

The real length of a road is 10 km.

(b) Work out the length of the road on the map.
Give the units of your answer.

1 cm : 4 km

x cm : 10 km

$\frac{1}{x} = \frac{4}{10}$

$x = \frac{10}{4} = 2.5$ cm (1)

2.5 cm (1)

.....

(2)

(Total for Question 5 is 4 marks)