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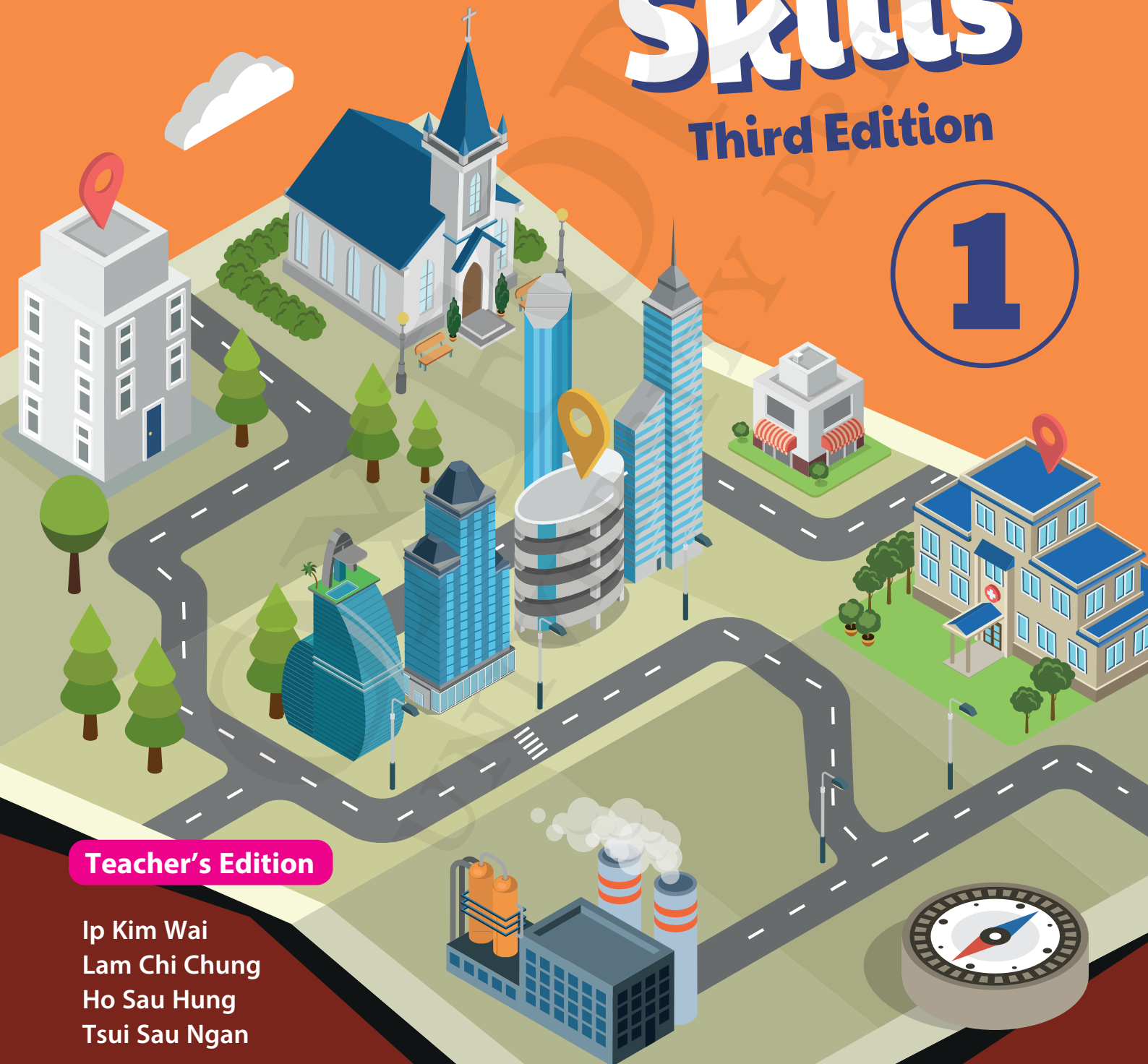
OXFORD

Junior Secondary
**Exploring
Geography**

Map-reading Skills

Third Edition

1



Teacher's Edition

Ip Kim Wai
Lam Chi Chung
Ho Sau Hung
Tsui Sau Ngan

SAMPLE

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Illustrated by Bill Cheung

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- 5 How can we locate places using latitudes and longitudes?

Integrated test

- Test 1
- Test 2
- Test 3
- Test 4
- Test 5





How can we locate a place using grid references?

How can we locate a place on a map by using grid references?

To locate a place on a map using grid references, we need to have two sets of imaginary (假想的) lines on the map. These are called **grid lines**. Look at Figure 3. The **vertical lines** are called **eastings** (東行線) (i.e. the orange ones); the **horizontal lines** are called **northings** (北行線) (i.e. the blue ones).

Each grid line has its number. The number of an easting (the orange numbers) and the number of a northing (the blue numbers) form a **grid reference** on the map. Each grid reference represents a **grid square** (格網方格).

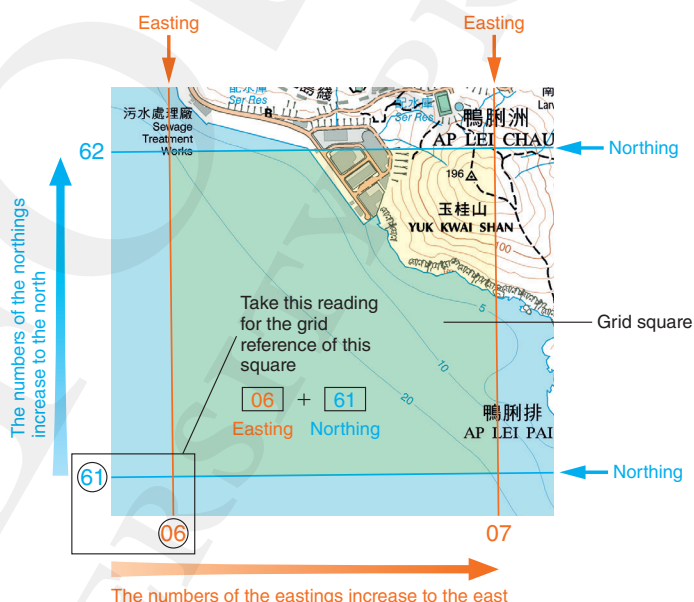



Figure 3 A grid system on a map

We can locate objects by using **four-figure grid reference** (四位數字格網座標) and **six-figure grid reference** (六位數字格網座標).

1 How can we find out the four-figure grid reference of a place?

Refer to Figure 3 again. The number of each grid line has two digits. When we **combine the number of the easting to the bottom** of the square (i.e. '06' in this example) **and the number of the northing to the left** of the same square (i.e. '61'), we can get a **four-figure grid reference** ('0661').  We can also refer the four-figure grid reference 0661 as grid square 0661.

2 How can we locate a place using grid references?

2 How can we find out the six-figure grid reference of a place?

If we want to tell the location of an object more accurately (準確地), we can subdivide (再分割) a grid square into 10×10 smaller grid squares. These small squares are represented by six-figure grid references. For example, the trigonometric station (196 m) in Figure 5 is 069619.

 Refer to p. iv about the use of a romer in finding grid references.

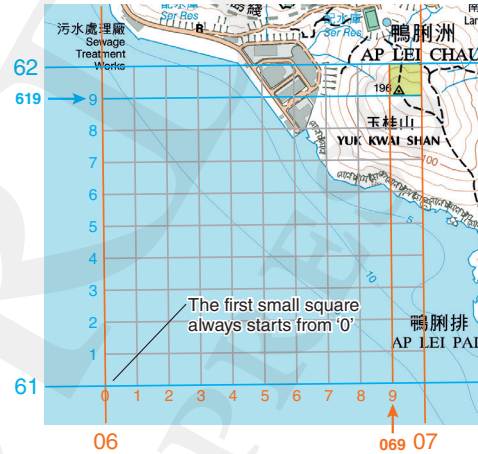


Figure 5 Six-figure grid reference

Follow the steps below to find out the six-figure grid reference of the trigonometric station.

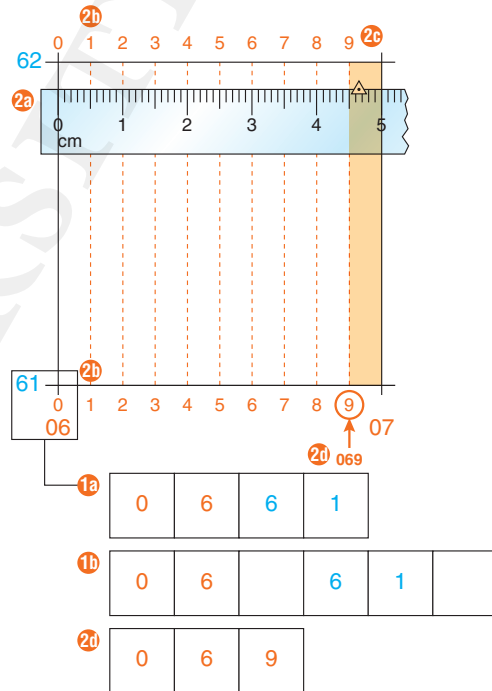
1 Find out the four-figure grid reference of the trigonometric station.

- 1a The four-figure grid reference is 0661.
- 1b Leave a space after the numbers of the easting and northing respectively.

2 Find out the easting reading.

- 2a Place a ruler over the trigonometric station. It should be parallel (平行) to the northings.
- 2b Divide the grid square between eastings 06 and 07 into 10 equal parts. Then, number the lines from '0' to '9'.
- 2c Start reading from line '0' and go east until you get the column in which the trigonometric station lies.

2d **Write down the number of the line on the left of the column**, i.e. 9. Thus, the easting reading of the trigonometric station is 069.



 Refer to p. iv for more information about grid references on different scales of maps.

3 Find out the northing reading.

- 3a** Place a ruler over the trigonometric station again. This time it should be parallel to the eastings.
- 3b** Divide the grid square between northings 61 and 62 into 10 equal parts. Then, number the lines from '0' to '9'.
- 3c** Again, read from line '0' and move north until you get the row in which the trigonometric station lies.
- 3d** Write down the number of the line at the bottom of the row, i.e. 9. Thus, the northing reading of the trigonometric station is 619.

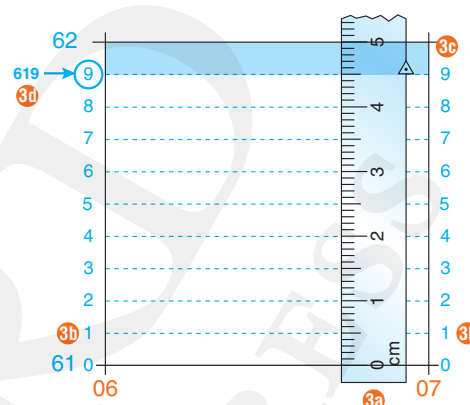
4 Combine the numbers of the easting and the northing to get the six-figure grid reference.

→ 069619

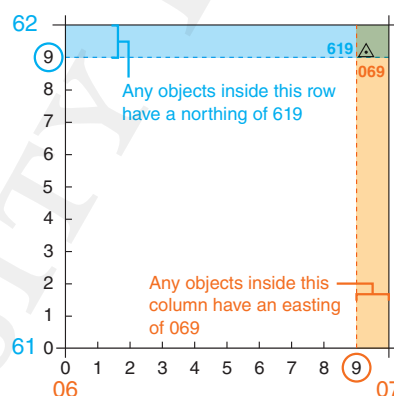


Finding out four-figure and six-figure grid references

- (Note: 1 Measure the centre of the conventional signs.
2 If the conventional sign falls on the easting or northing, take the number of the grid line as the reading.)



6	1	9
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Wise tips

Steps to finding out the grid references from an incomplete grid square

We can take similar steps to find out the six-figure grid reference of a feature from an incomplete grid square (Figure 6).

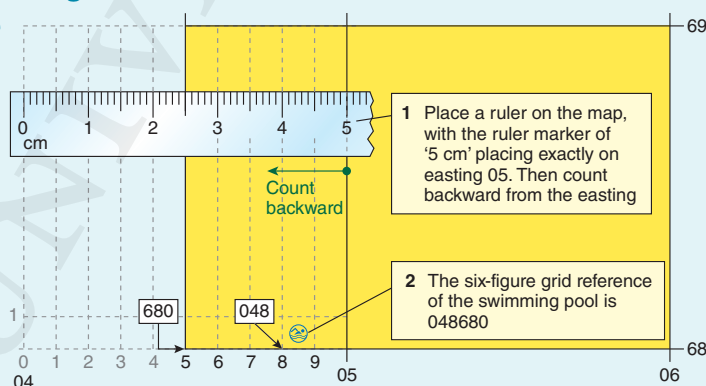


Figure 6 Finding out the grid reference from an incomplete grid square



Checkpoint is added at the end of each map-reading skill to allow students to practise the skills just learned

2 How can we locate a place using grid references?

Checkpoint 2.3

Refer to Figure 7 and answer the following questions.

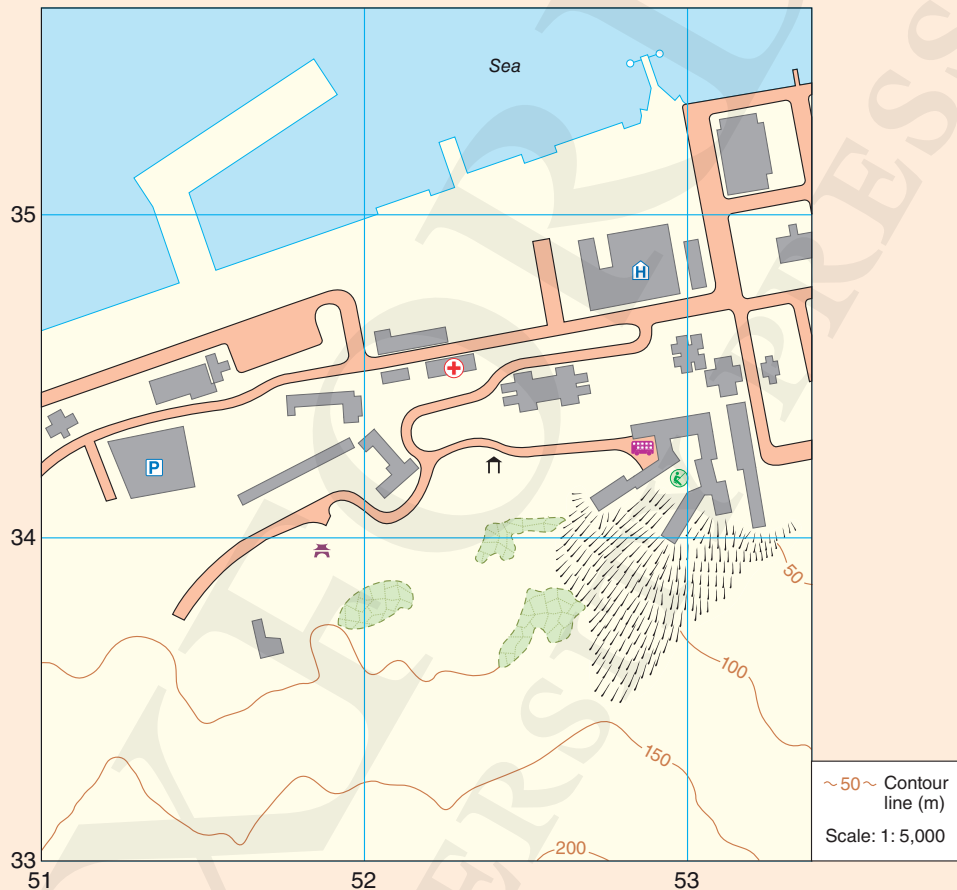


Figure 7

1 Give the four-figure grid references of the following features. (Hint: There can be more than one answer.)

a Cultivation 5133, 5233, 5234

b A car park 5134

2 Give the six-figure grid references of the following features.

a A hotel 528348 d A pavilion 524342

b A clinic 522345 e A bus terminus 528342

c A temple 518339 f A playground 529341



Exercises based on both simplified maps and maps of 1:5,000/1:20,000 are provided for each skill to help students grasp the skills progressively

How can we locate a place using grid references?

2

Checkpoint 2.4

Refer to Figure 8 which shows a 1:20,000 map of Kwai Chung. Answer the following questions.



Figure 8

- 1 Give the four-figure grid references of the following features. (*Hint: There can be more than one answer.*)
 - a Tunnel 0577, 0677
 - b Kwai Chung Estate 0476
 - c Shing Mun Valley Park 0376, 0377, 0477
- 2 Give the six-figure grid references of the following features.
 - a The fire station next to Wo Yi Hop Road 051771
 - b The post office in Lei Muk Shue Estate 050776
 - c The church next to Kwai Chung Estate 040763

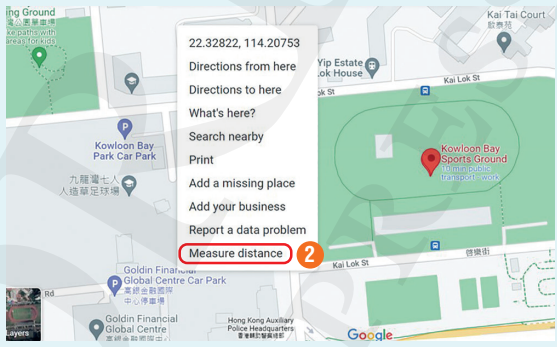
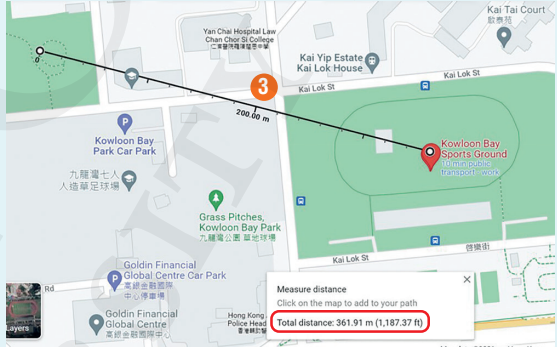
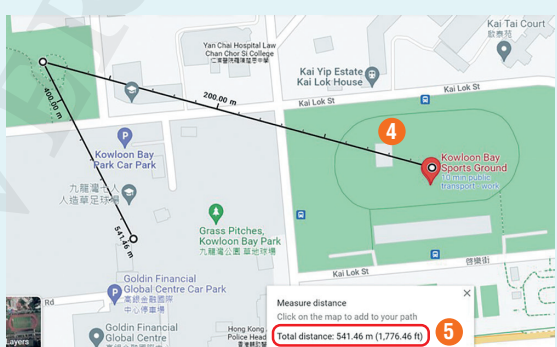



How can we locate a place using distance and direction?

Wise tips

How can we measure distance on Google Maps?

We can measure the actual distance of different places on Google Maps.

- 1 Go to Google Maps (<https://www.google.com/maps>) and search for the locations you want.
- 2 Right-click the starting point. Select 'measure distance (測量距離)'.

- 3 Click the end point (or second point) to create a direct line from the original point. The actual direct distance between the two points is shown along the line and in the pop-up box.

- 4 If you want to measure the distance along a path with different points, click these points in correct order.

- 5 The total distance will appear in the pop-up box as well.


3 How can we locate a place using distance and direction?

3 By reduced bearings

a What is a reduced bearing?

A **reduced bearing** (象限角) shows direction by combining the four basic compass points (N, E, S and W) with whole-circle bearings.

The circle of **the compass is divided into four quadrants** (象限), namely **north-east, south-east, south-west and north-west quadrants**. Each quadrant has 90° (Figure 15).

The direction is read either from the north or the south, towards the east or the west. Therefore, the angle of the bearing can never be greater than 90° .

i The reduced bearings of north, east, south and west are N, E, S and W.

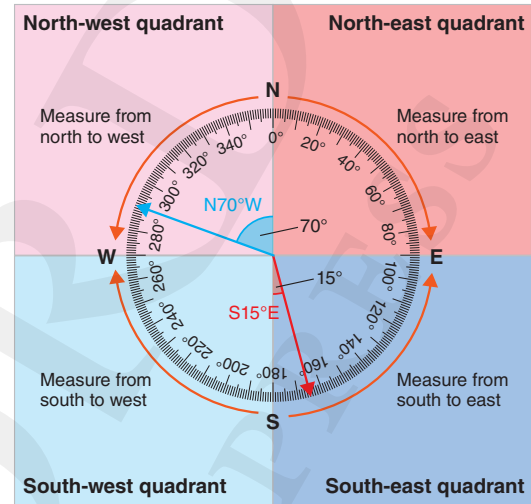
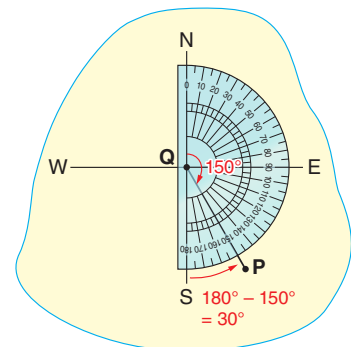
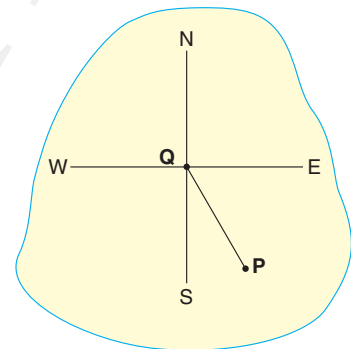


Figure 15 Four quadrants of a compass

b How can we find the reduced bearing of Place P from Place Q?

- 1 Draw a cross over Place Q and mark the four main compass points.
- 2 Place a protractor over Place Q. Make sure 0° aligns with the north and 90° aligns with the east. Then, measure the degree from the south towards the east, i.e. $180^\circ - 150^\circ = 30^\circ$.
- 3 Place P is in the south-east quadrant. So, the reduced bearing of Place P is $S30^\circ E$ from Place Q.



Scan me!



Finding direction



QR code links to guided animations to consolidate students' knowledge (Let's scan the QR code to have the demo clip)



Integrated tests covering all skills provide comprehensive exercises for students

Test 3

Figure 7 shows a 1:20,000 map of Fanling–Sheung Shui.

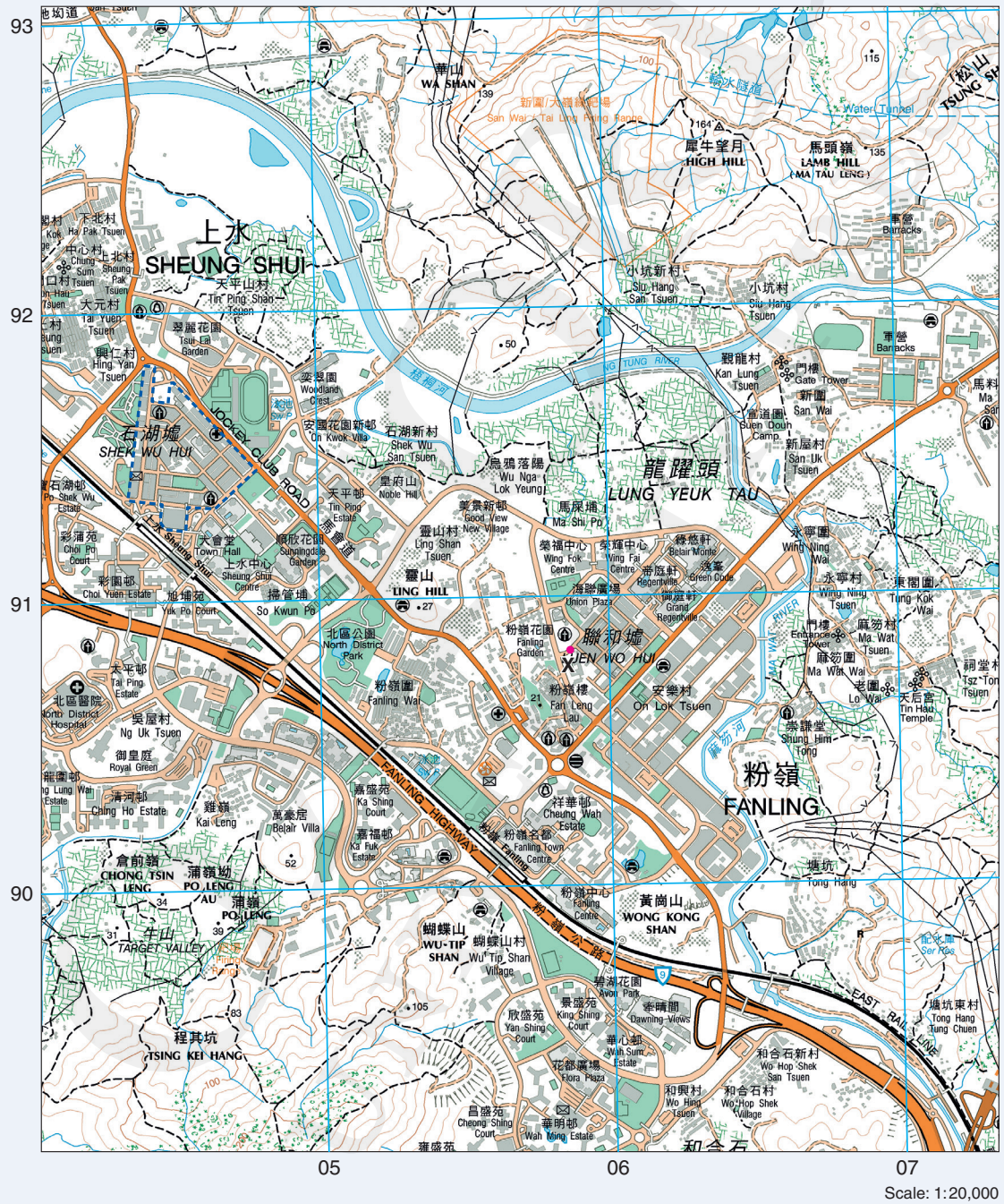


Figure 7

A Multiple-choice questions (2 marks each, total 16 marks)

Refer to Figure 7 on p. 61 and answer Questions 1 to 8.

1 Which of the following features are found in grid square 0589?

- 1 Temple
 - 2 Fire station
 - 3 Sports ground
- A 1 and 2 only
 B 1 and 3 only
 C 2 and 3 only
 D 1, 2 and 3

B

2 Which of the following matches is/are correct?

	Place	Grid square
1	Artificial slope	0489
2	Sunningdale Garden	0491
3	Wo Hop Shek San Tsuen	0689

- A 2 only
 B 1 and 2 only
 C 1 and 3 only
 D 2 and 3 only

D

3 What is the compass point of Tai Ping Estate (043907) from Fanling Town Centre (057901)?

- A North-west
 B South-west
 C South-east
 D North-east

A

4 What is the reduced bearing of the police station at 058904 from North District Hospital at 041907?

- A N18°E
 B S82°E
 C N82°W
 D S12°W

B

5 Which of the following places (in grid square 0590) can be found at 32° of the spot height 105 (052895)?

- A Clinic
 B Temple
 C Post office
 D Fire station

D

6 Oscar is standing at Location X (in grid square 0590) and taking the photograph shown in Figure 8. Which direction by compass points is the camera facing?



Figure 8

- A North-east
 B South-east
 C North-west
 D South-west

C

7 What is the actual length of the railway running between Sheung Shui Station (0491) and Fanling Station (0590)?

- A 750 m
 B 920 m
 C 1,280 m
 D 2,740 m

C

8 Which of the following places is/are within 0.5-km distance from Fanling Station (0590)?

- 1 Fanling Garden (0590)
- 2 Wu Tip Shan Village (0589)
- 3 Wong Kong Shan (0689)

- A 1 only
 B 3 only
 C 1 and 2 only
 D 2 and 3 only

D

B Structured questions (18 marks)

Refer to Figure 7 on p. 61 and answer the following questions.

- 1 a Name the type of scale shown on the map. (1 mark)

R.F.


- b Change the scale into other types. (2 marks)

Statement scale: 1 cm to 200 m

Linear scale: 

- 2 Find out the grid references of the features in Table 9. (2 marks)

Table 9

Feature	Four-figure grid reference	Feature	Six-figure grid reference
 Luen Wo Hui	0590, 0690	Trigonometric station 164	064926

- 3 Find the directions between the places below. (2 marks)

- a The whole-circle bearing of spot height 83 (046895) from spot height 52 (048901)

203° (±1°)

- b The reduced bearing of the clinic (046915) in Shek Wu Hui from spot height 139 (056927)

S38°W (±1°)

- 4 What is the actual length of the section of the Ng Tung River flowing from 040926 to 060918? Show your calculations. (2 marks)

$200 \text{ m} \times 13.1 = 2,620 \text{ m} (\pm 40 \text{ m})$

- 5 What is the actual area of Shek Wu Hui in grid square 0491 (the area bounded by the blue dotted-line)? Show your calculations. (3 marks)

$(200 \text{ m} \times 0.2) \times (200 \text{ m} \times 2.3) + (200 \text{ m} \times 0.3) \times (200 \text{ m} \times 1.7) + \frac{[(200 \text{ m} \times 1.4) + (200 \text{ m} \times 2.1)] \times (200 \text{ m} \times 0.9)}{2} +$

$(200 \text{ m} \times 0.4) \times (200 \text{ m} \times 0.4) + \frac{(200 \text{ m} \times 1.4) \times (200 \text{ m} \times 0.7)}{2}$

$= 18,400 \text{ m}^2 + 20,400 \text{ m}^2 + 63,000 \text{ m}^2 + 6,400 \text{ m}^2 + 19,600 \text{ m}^2 = 127,800 \text{ m}^2 (\pm 10,000 \text{ m}^2)$

- 6 *Certain areas in Fanling–Sheung Shui have a long history of development.*

Quote map evidence to support the statement above. (6 marks)

There are many declared monuments in the area, e.g. (give

TWO examples) Gate Tower in grid square 0691 and

Tin Hau Temple in grid square 0790.

Other examples of declared monuments in the area include the one in Lo Wai and Entrance Tower (0690), as well as the one in Chung Sum Tsuen (0492).



New questions on map interpretation train students the skills needed in senior forms

- 4 Complete Table 8 to show the favourable factors for developing farming to the south of the South Lantau Road. Quote map evidence to support your answers. (9 marks)

Table 8

Favourable factor	Map evidence
Availability of <u>flat</u> land for farming	Area along the coast is low-lying/The height of land is below <u>10</u> metres
Supply of <u>irrigation</u> water	There is a <u>stream/river</u> nearby
Availability of <u>labour</u>	There are <u>settlements</u> nearby
Convenient <u>transport</u> . Farm produce can be transported to <u>markets</u> easily	There is a <u>road</u> providing links to other areas

- 5 Complete Table 10 to show the problems that residents live in Place X (466334) may face. Give map evidence to support your answers. (4 marks)

Table 10

Problem	Map evidence
<u>Traffic congestion</u>	Narrow streets, e.g. the width of Fife Street is <u>5</u> m only
Lack of <u>open</u> space	<u>Park/Playground</u> (give ONE example) is not present within 200-m distance from Place X

- 4 Complete Table 12 to show ONE advantage of the location of Fu Shin Estate (0985) and Tai Po Industrial Estate (north of northing 85). Give map evidence to support your answers. (4 marks)

Table 12

	Advantage	Map evidence
Fu Shin Estate	<ul style="list-style-type: none"> <u>Nice view/Open space</u> <u>Convenient transport</u> <u>Availability of community services</u> 	<ul style="list-style-type: none"> <u>Waterfront Park nearby/Greenery nearby</u> <u>There are many roads nearby</u> <u>There are many community facilities and services in the area, e.g. police station (0985)/post office (0985)/hospitals (0986)/clinic (0885)</u>



PDF file provides hide-show-answer function for easy answer checking

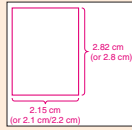
Show Answer

3 How can we locate a place using distance and direction?



Check-point 3.1

Try to draw your Map-reading Skills book in a scale of 1:10 in the box provided.



2 What are large-scale maps? What are small-scale maps?

Figures 4a-d show the location of Hong Kong at different scales.



Figure 4a Hong Kong on a 15,000 map

Figure 4b Hong Kong on a 200,000 map

Figure 4d Hong Kong on a 15,000,000 map

Figure 4c Hong Kong on a 1,000,000 map

How can we locate a place using distance and direction?

A **large-scale map** shows a **smaller actual area** in **more detail**. For example, map (Figure 4a) is a large-scale map. Objects shown are large.

A **small-scale map** covers a **larger actual area** in **less detail**. For example, a 1:200,000 map (Figure 4b) is a small scale map. Objects shown are small.

The areas covered in the maps of different scales are not the same. The details of information shown also differ.

Wise tips

Which scale is larger?

$$\frac{1}{200} > \frac{1}{20,000,000}$$

The larger the value of the denominator (分母), the smaller the scale.

Therefore, scale 1:200 is larger.

It is always easier to explain to students the differences between two scales by showing the scales in the form of a fraction. To some less able students, fraction and scale are different concepts. Teachers can ask them to compare the case of cutting an orange into halves and quarters, i.e. the former is $\frac{1}{2}$ and the latter is $\frac{1}{4}$. Ask students which is larger.

Check-point 3.2

Compare Figures 4c and 4d. Which map has a larger scale? Compare the differences between these two maps and complete Table 1.

Table 1

	Figure 4c	Figure 4d
Scale	• 1: <u>1,000,000</u> • (Larger / Smaller)	• 1: <u>15,000,000</u> • (Larger / Smaller)
Type of map	A (larger-scale / smaller-scale) map	A (larger-scale / smaller-scale) map
Actual area shown	(Larger / Smaller)	(Larger / Smaller)
Details of objects	(More / Less)	(More / Less)

3 How can we locate a place using distance and direction?



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Figure 4c Hong Kong on a 1,000,000 map

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Wise tips

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Hide Answer

Check-point 3.2

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Table 1

	Figure 4c	Figure 4d
Scale	• 1: _____ • (Larger / Smaller)	• 1: _____ • (Larger / Smaller)
Type of map	A (larger-scale / smaller-scale) map	A (larger-scale / smaller-scale) map
Actual area shown	(Larger / Smaller)	(Larger / Smaller)
Details of objects	(More / Less)	(More / Less)



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Junior Secondary
Exploring Geography
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Third Edition

Junior Secondary Exploring Geography Map-reading Skills (Third Edition) is written specially for Secondary 1–3 Geography students. The series consists of two books covering all essential map-reading skills. This provides a systematic learning process for students.

Special features

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- **Checkpoints** provide drilling exercises for practice
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- **Integrated tests** consolidate students' understanding of the skills learned in a comprehensive way
- Exercises based on **sketch maps**, as well as **maps of 1:5,000 and 1:20,000**, allow students to familiarise themselves with different map scales of progressive difficulty
- **Exercises on map interpretation** train students with the skills they need in senior forms
- **Multimedia resources** such as animations, AR and Google Earth enhance learning

This **Teacher's Edition** contains teaching suggestions, extra information, as well as answers to the questions in the student book.



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