Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

0959876425

MATHEMATICS **0580/32**

Paper 3 (Core) **May/June 2015**

2 hours

Candidates answer on the Question Paper.

Additional Materials: Electronic calculator
Tracing paper (optional)
Geometrical instruments

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
If working is needed for any question it must be shown below that question.
Electronic calculators should be used.
If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.
For π, use either your calculator value or 3.142.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.
The total of the marks for this paper is 104.

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **16** printed pages.

1 **(a)** 4 3 0 2 9 5 7

From the list above, write down

(i) the factors of 24,

Answer(a)(i) ..... [1]

(ii) a prime factor of 24,

Answer(a)(ii) ..... [1]

(iii) the highest common factor (HCF) of 56 and 91,

Answer(a)(iii) ..... [1]

(iv) the square root of 49,

Answer(a)(iv) ..... [1]

(v) the cube root of 27.

Answer(a)(v) ..... [1]

(b) **(i)** Using four numbers from the list in **part (a)**, form the largest 4-digit number.

Answer(b)(i) ..... [1]

(ii) Write your answer to **part (b)(i)** in words.

Answer(b)(ii) .....

..... [1]

(c) Find

(i) the common multiple of 5 and 8 between 100 and 150,

Answer(c)(i) ..... [1]

(ii) the square number between 350 and 390.

Answer(c)(ii) ..... [1]

2 **(a)** Simplify.

$$7e - 5f + 4e - f$$

Answer(a) ..... [2]

(b) Find the value of $8g - 9h$ when $g = 5$ and $h = -3$.

Answer(b) ..... [2]

(c) Solve the equation.

$$4x - 7 = 29$$

Answer(c) $x =$ ..... [2]

(d) Simplify.

$$k^4 \div k^{11}$$

Answer(d) ..... [1]

(e) Pens cost p cents and pencils cost w cents.

(i) Aisha buys 3 pens and 5 pencils for \$2.20 .
Complete the equation representing this cost in cents.

Answer(e)(i) $3p + 5w =$ ..... [1]

(ii) Bishen buys 4 pens and 10 pencils for \$3.50 .
Write down an equation representing this cost in cents.

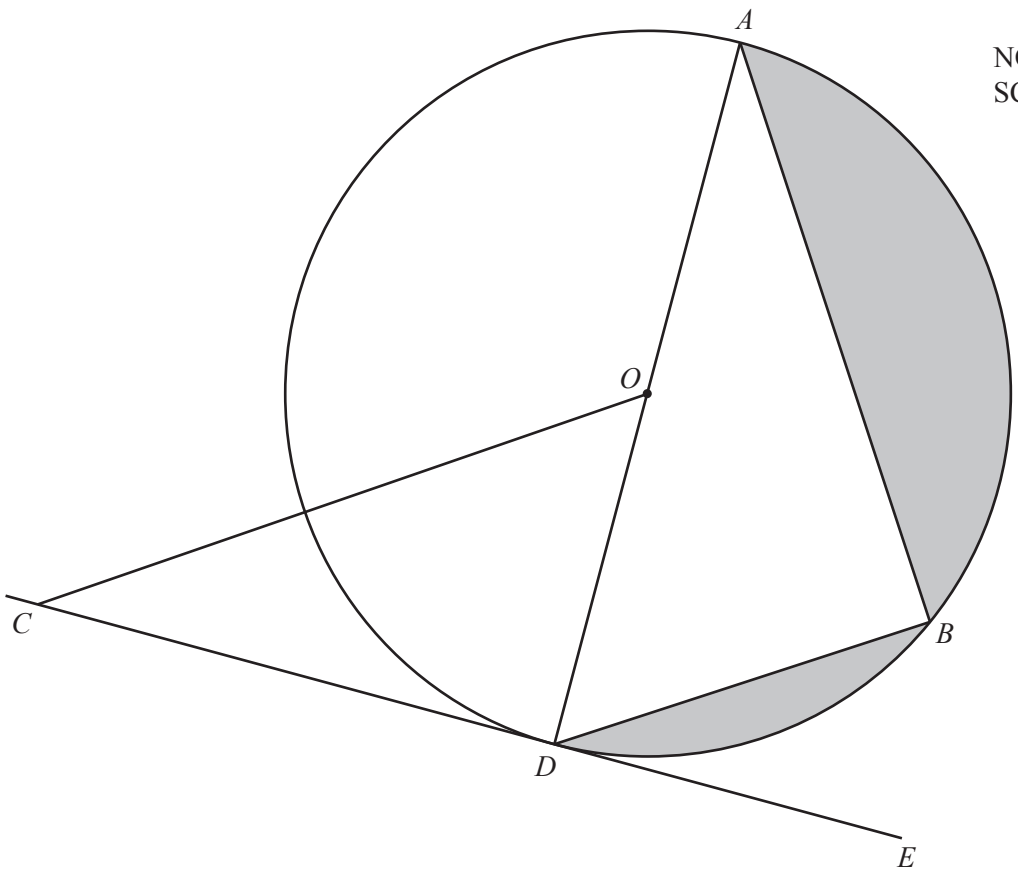
Answer(e)(ii) ..... [1]

(iii) Solve your equations to find the value of p and the value of w.

Answer(e)(iii) $p =$ .....

$w =$ ..... [3]

3



The diagram shows a circle, centre O and diameter AD.
B is on the circumference of the circle and the line CDE touches the circle at D.
$AD = 21$ cm and $CD = 16$ cm.

(a) Calculate

(i) the circumference of the circle,

Answer(a)(i) ..... cm [2]

(ii) the area of the circle.

Answer(a)(ii) ..... cm^2 [2]

(b) (i) Write down the size of angle *ABD*.

Answer(b)(i) Angle *ABD* = ... [1]

(ii) *BD* = 9 cm.

Show that *AB* = 19.0 cm, correct to 3 significant figures.

Answer(b)(ii)

[3]

(c) (i) Calculate the area of triangle *ABD*.

Answer(c)(i) ..... cm^2 [2]

(ii) Work out the total area of the shaded segments of the circle.

Answer(c)(ii) ..... cm^2 [2]

(d) (i) Write down the mathematical name of the line *CDE*.

Answer(d)(i) ..... [1]

(ii) Write down the mathematical name of the line *OD*.

Answer(d)(ii) ..... [1]

(iii) Use trigonometry to calculate the size of angle *OCD*.

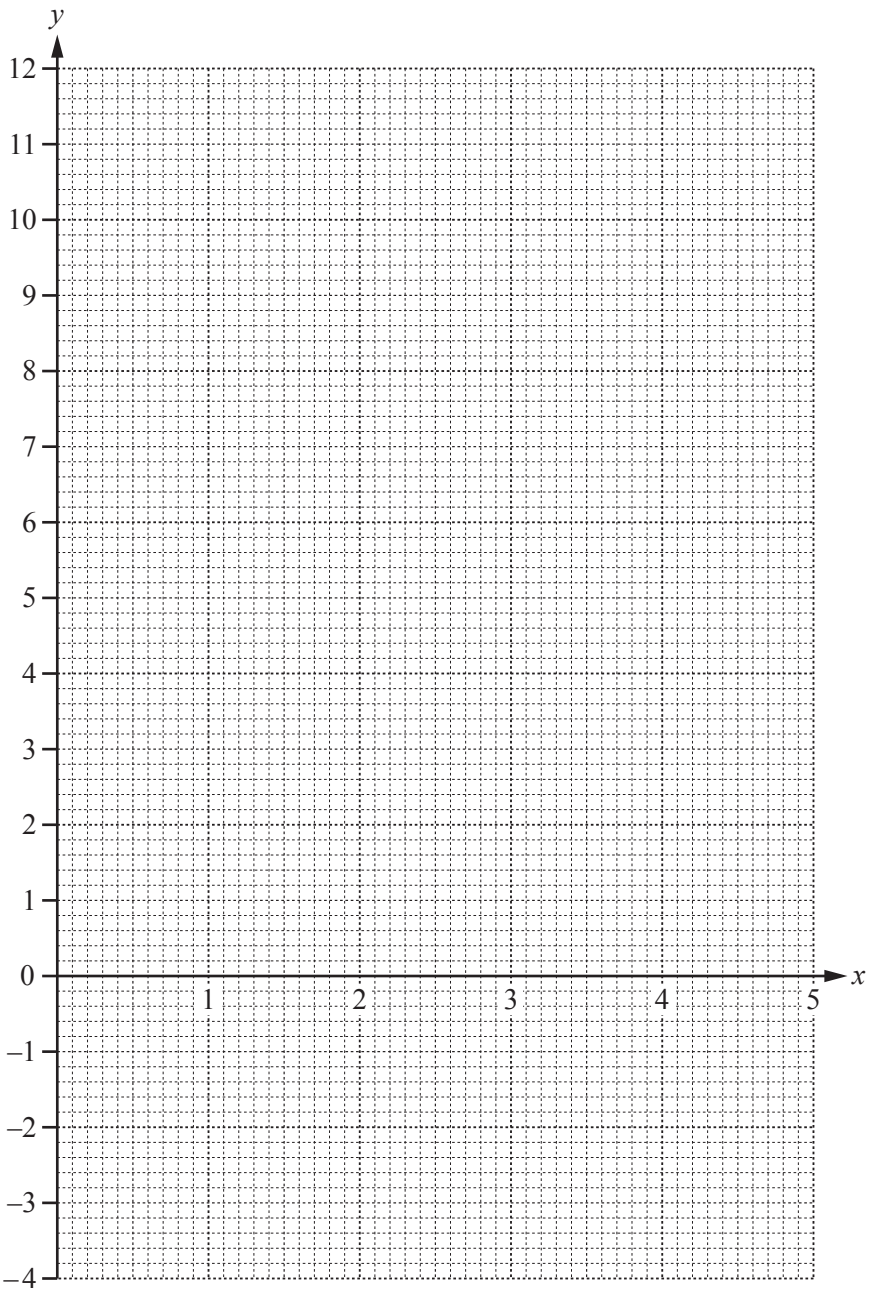
Answer(d)(iii) Angle *OCD* = ... [2]

4 (a) (i) Complete the table of values for $y = 8 + 3x - x^2$.

x	0	1	2	3	4	5
y	8		10	8	4	

[2]

(ii) On the grid, draw the graph of $y = 8 + 3x - x^2$ for $0 \leqslant x \leqslant 5$.



[3]

(iii) Write down the co-ordinates of the highest point of the graph.

Answer(a)(iii) (..... , ...) [1]

(b) (i) Complete the table of values for $y = \frac{12}{x}$.

x	1	2	3	4	5
y	12		4		2.4

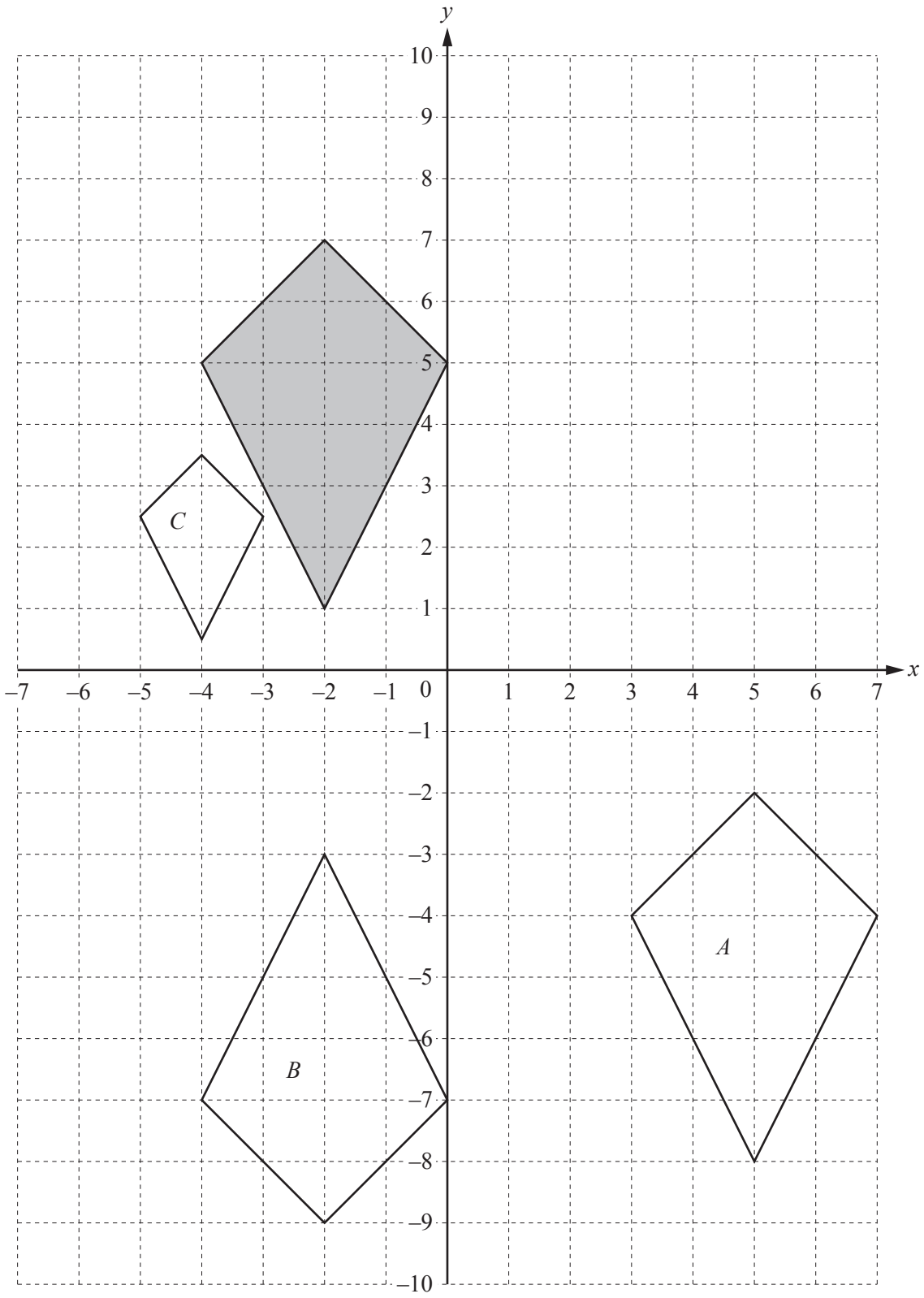
[2]

(ii) On the same grid, draw the graph of $y = \frac{12}{x}$ for $1 \leqslant x \leqslant 5$. [3]

(c) Use your graphs to write down the solutions of the equation $8 + 3x - x^2 = \frac{12}{x}$.

Answer(c) $x =$ ..... or $x =$ ..... [2]

5



(a) For the shaded quadrilateral, write down

(i) its mathematical name,

Answer(a)(i) ..... [1]

(ii) the number of lines of symmetry.

Answer(a)(ii) ..... [1]

(b) The quadrilaterals are drawn on a 1 cm^2 grid.

Work out the area of the shaded quadrilateral.

Answer(b) ..... cm^2 [1]

(c) Describe fully the **single** transformation that maps the shaded quadrilateral onto

(i) quadrilateral *A*,

Answer(c)(i) .....

..... [2]

(ii) quadrilateral *B*,

Answer(c)(ii) .....

..... [2]

(iii) quadrilateral *C*.

Answer(c)(iii) .....

..... [3]

(d) On the grid, draw the image of the shaded quadrilateral after a rotation of 90° clockwise about the origin. [2]

6 Khamisi is trying to reach the standard required for competing in an international athletics competition.

(a) He arrives home from college at 16 15.
He divides his time before going to bed between training, studying and eating.

(i) He spends $3\frac{1}{4}$ hours training.

Show that $3\frac{1}{4}$ hours is equivalent to 195 minutes.

Answer(a)(i)

[1]

(ii) He spends $2\frac{1}{2}$ hours studying and 45 minutes eating.

Work out the time he goes to bed.

Answer(a)(ii) ..... [2]

(iii) Find, in its simplest form, the ratio training : studying : eating.

Answer(a)(iii) Training : studying : eating = ... : ..... : ..... [2]

(b) Khamisi divides his 195 minutes training into three sessions.

- 40% of the time on the running track
- $\frac{2}{13}$ of the time with his trainer
- the remaining time in the gym

Calculate the time, in minutes, he spends

(i) on the running track,

Answer(b)(i) ..... min [1]

(ii) with his trainer,

Answer(b)(ii) ..... min [1]

(iii) in the gym.

Answer(b)(iii) ..... min [1]

(c) Khamisi is a sprinter and he wants to qualify for the 200 metres race.
His best time is 22.5 seconds and the qualifying time is 20.7 seconds.

Calculate the percentage decrease in his best time needed in order to reach the qualifying time.

Answer(c) ..... % [3]

7 A machine produces nails.

(a) A random sample of 100 nails is taken from the machine.
The lengths are measured and recorded in the table.

Length (mm)	62	63	64	65	66	67	68
Number of nails	0	12	30	35		8	0

(i) Complete the table. [1]

(ii) Write down the modal length.

Answer(a)(ii) ..... mm [1]

(iii) Write down the range of the lengths.

Answer(a)(iii) ..... mm [1]

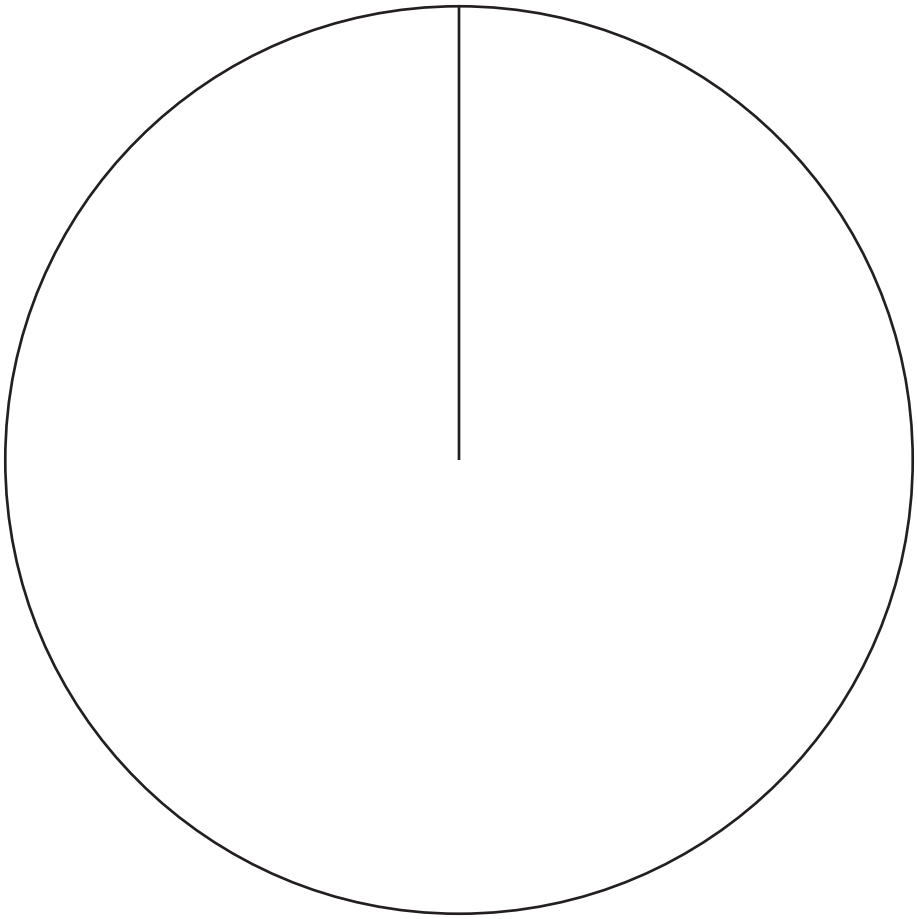
(iv) Calculate the mean length.

Answer(a)(iv) ..... mm [3]

(v) Nails that have length 64 mm, 65 mm or 66 mm are accepted.
Other nails are rejected.

Number of nails accepted	80
Number of nails rejected	20

Complete the pie chart to show the proportion of nails that are accepted and rejected.



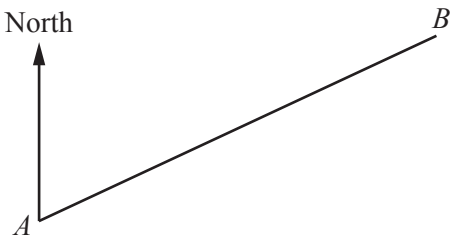
[3]

(b) One nail from the machine measures 65 mm, correct to the nearest millimetre.

Complete the statement about the length, n mm, of this nail.

Answer(b) ..... $\leqslant n <$ ..... [2]

8 The scale drawing shows one side, AB, of a 4-sided field.
The scale is 1 centimetre represents 20 metres.



Scale: 1 cm to 20 m

(a) (i) Work out the actual distance AB.

Answer(a)(i) AB = ... m [2]

(ii) Measure the bearing of B from A.

Answer(a)(ii) ..... [1]

(b) In this part use a ruler and compasses only and show your construction arcs clearly.

Point C is 240 m from A and 140 m from B.

On the scale drawing, construct the position of point C. [2]

(c) Point D is 200 m on a bearing of 135° from A.

On the scale drawing, draw accurately the line AD. [3]

(d) Work out the actual perimeter of the field $ABCD$.

Answer(d) ..... m [3]

Question 9 is printed on the next page.

9 Nina is going on a holiday to Dubai from her home in Mumbai.

(a) At the airport she buys 2 packets of sandwiches and 3 magazines.

Complete her shopping bill in Indian rupees.

2 packets of sandwiches at 325 rupees per packet = ... rupees

3 magazines at 75 rupees per magazine = ... rupees

Total = ... rupees [3]

(b) She changed 10 000 rupees to dirhams when the exchange rate was 18.3 rupees = 1 dirham.

How much did she receive?

Answer(b) ..... dirhams [2]

(c) The flight from Mumbai to Dubai takes 2 hours 50 minutes.
The distance from Mumbai to Dubai is 1937 km.

(i) Show that the average speed of the flight is 684 km / h, correct to the nearest whole number.

Answer(c)(i)

[2]

(ii) Nina's flight leaves Mumbai at 13 15.
The local time in Mumbai is $1\frac{1}{2}$ hours ahead of the local time in Dubai.

Find the time of arrival in Dubai.
Give your answer in the 24-hour clock.

Answer(c)(ii) ..... [2]