FOR OFFICIAL USE

G

	KU	RE
Total marks		

2500/403

NATIONAL QUALIFICATIONS 2004

FRIDAY, 7 MAY
10.40 AM – 11.15 AM

MATHEMATICS
STANDARD GRADE
General Level
Paper 1
Non-calculator

Fill in these boxes and read what is printed below.

Full name of centre

Town

Forename(s)

Surname

Date of birth
Day Month Year

Scottish candidate number

Number of seat

1 **You may <u>not</u> use a calculator.**

2 Answer as many questions as you can.

3 Write your working and answers in the spaces provided. Additional space is provided at the end of this question-answer book for use if required. If you use this space, write clearly the number of the question involved.

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FORMULAE LIST

Circumference of a circle: $C = \pi d$

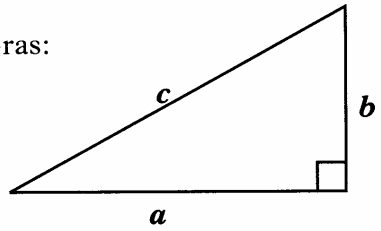
Area of a circle: $A = \pi r^2$

Curved surface area of a cylinder: $A = 2\pi rh$

Volume of a cylinder: $V = \pi r^2 h$

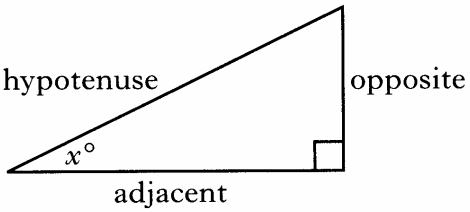
Volume of a triangular prism: $V = Ah$

Theorem of Pythagoras:



$$a^2 + b^2 = c^2$$

Trigonometric ratios in a right angled triangle:

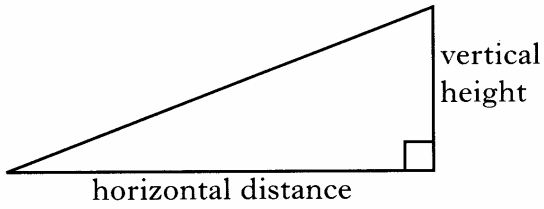


$$\tan x^\circ = \frac{\text{opposite}}{\text{adjacent}}$$

$$\sin x^\circ = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos x^\circ = \frac{\text{adjacent}}{\text{hypotenuse}}$$

Gradient:



$$\text{Gradient} = \frac{\text{vertical height}}{\text{horizontal distance}}$$

DO NOT WRITE IN THIS MARGIN

Marks	KU	RE

1. Carry out the following calculations.

(*a*) $14{\cdot}93 - 3{\cdot}7 + 2{\cdot}15$

1

(*b*) $42{\cdot}8 \times 7$

1

(*c*) $1710 \div 3000$

1

(*d*) 90% of £180

2

2. Express $\frac{3}{7}$ as a decimal.

Give your answer correct to two decimal places.

2

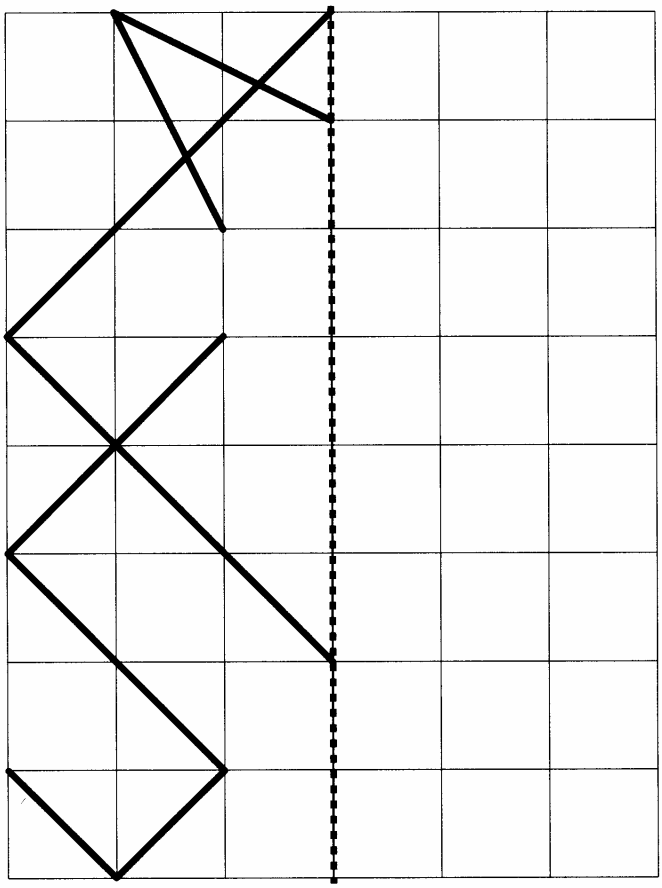
DO NOT WRITE IN THIS MARGIN

Marks	KU	RE

3. Ann Fiona Johnstone has drawn a design which uses her initials.

She wants her finished design to be symmetrical.

Complete her design so that the dotted line is an axis of symmetry.



3

4. The largest ocean in the world is the Pacific Ocean.

Its area is approximately $1{\cdot}813 \times 10^8$ square kilometres.

Write this number in full.

1

DO NOT WRITE IN THIS MARGIN

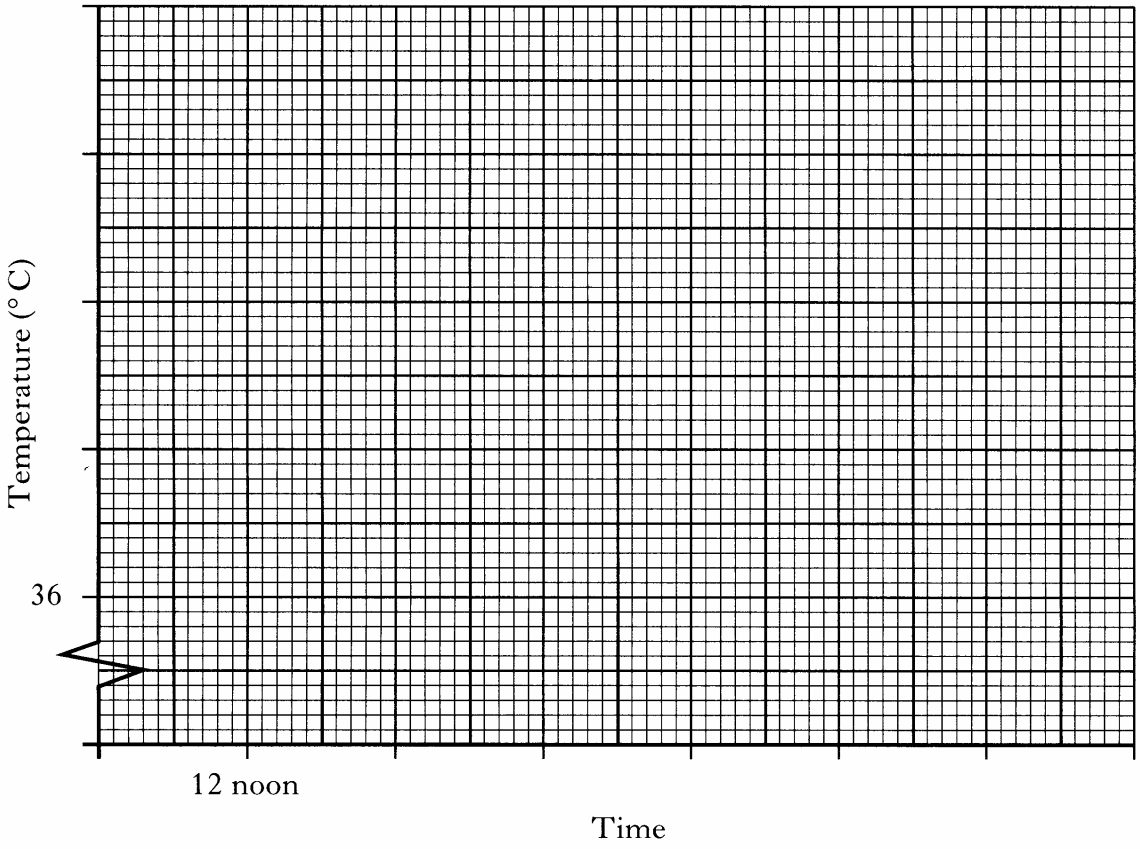
Marks	KU	RE

5. A patient in hospital had his temperature checked every two hours. The results are shown in the table below.

Time	12 noon	2 pm	4 pm	6 pm	8 pm	10 pm
Temperature (° C)	38·2	38·6	38·1	37·9	37·5	36·9

Illustrate this data on the grid below using a line graph.

Temperature Chart



4

[Turn over

DO NOT WRITE IN THIS MARGIN

Marks	KU	RE

6. Last month a garage sold 12 red cars, 9 silver cars and 15 black cars.

Joe bought one of these cars.

What is the probability that the car Joe bought was silver?

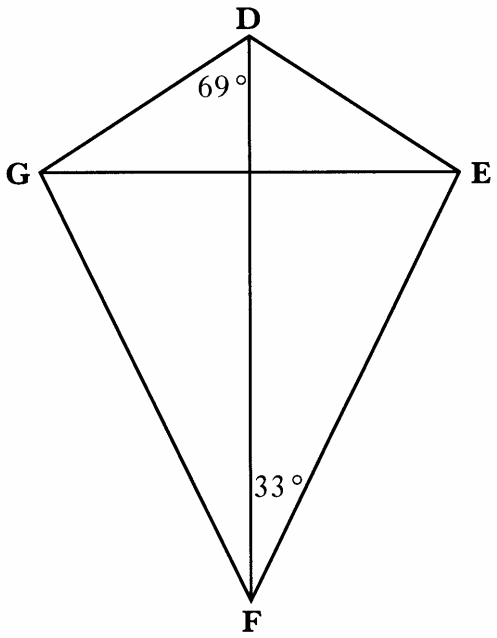
Give your answer as a fraction in its simplest form.

2

7. DEFG is a kite.

- Angle GDF = 69°
- Angle EFD = 33°

Calculate the size of angle DGF.



3

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Marks | KU | RE

8. Christy needs a four-digit code to switch on her mobile phone.

She uses the digits from her birth date 4/3/89, but in a different order.

She knows that the last digit is 8.

One of the possible four-digit codes Christy could try is shown in the table below.

Complete the table to show all the possible four-digit codes.

4	3	9	8

3

9. A recipe for Shortbread uses the following ingredients.

300 grams flour
100 grams sugar
200 grams butter

Alana has only 240 grams of flour.

To make Shortbread using all of the 240 grams of flour she will have to adjust the quantities of sugar and butter.

How many grams of sugar and how many grams of butter should she use?

4

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10. The heating in Bruce's house switches on automatically when the outside temperature drops to –5 °C.

One day last winter the outside temperature was 3 °C.

Calculate the drop in temperature when the heating switched on automatically.

2

11. Andrew and his brother are flying to America on holiday.

Their flight times are shown below.

Depart Glasgow	30/6/04	2120
Arrive Reykjavik, Iceland	30/6/04	2235
Depart Reykjavik, Iceland	1/7/04	0105
Arrive New York, USA	1/7/04	0455

How long will the brothers have to wait at Reykjavik in Iceland before their flight to New York?

2

[END OF QUESTION PAPER]

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NATIONAL QUALIFICATIONS 2004

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MATHEMATICS STANDARD GRADE

General Level
Paper 2

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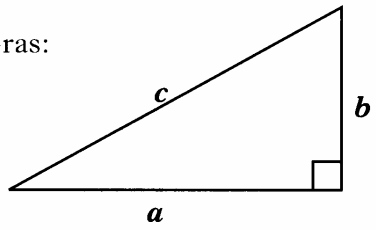

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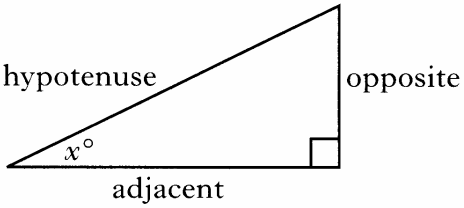

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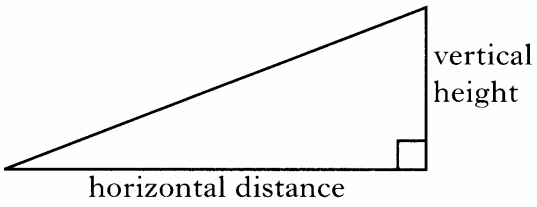

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1. 100 grams of wholemeal bread contain the following:

Protein	10 grams
Carbohydrates	55 grams
Fibre	9 grams
Fat	3 grams
Other	23 grams

A pie chart is to be drawn to show this information.

What size of angle should be used for the carbohydrates?

DO NOT DRAW A PIE CHART.

2

[Turn over

DO NOT WRITE IN THIS MARGIN

Marks | KU | RE

2. A company manufactures boxes of tacks and claims that there are "on average" 60 tacks per box.

This claim is tested by counting the number of tacks in a sample of 100 boxes.

The results are shown below.

Number of tacks	Frequency	Number of tacks × Frequency
57	7	
58	13	
59	21	
60	24	
61	19	
62	12	
63	4	
Totals	100	

(*a*) Find the mean number of tacks per box.

3

(*b*) Is the company's claim reasonable?

You must give a reason for your answer.

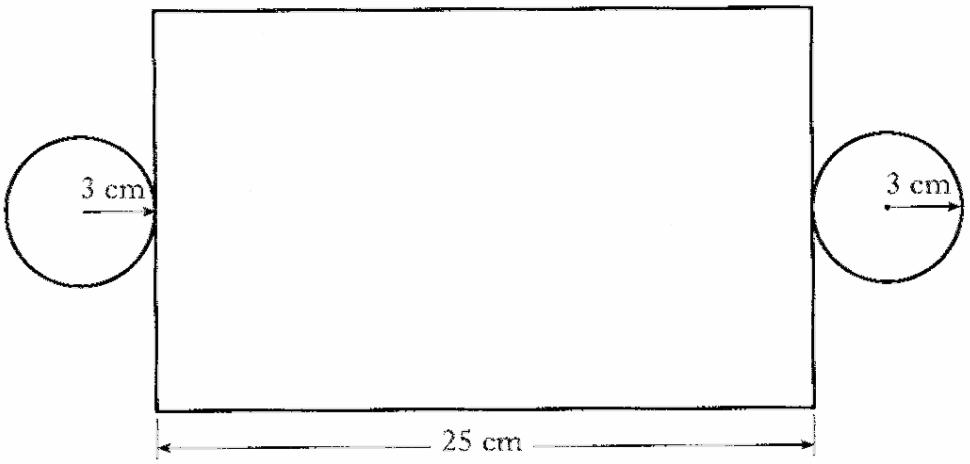
1

DO NOT WRITE IN THIS MARGIN

Marks | KU | RE

3. The sketch below shows the net of a three-dimensional shape.

The net consists of a rectangle and two equal circles of radius 3 centimetres.



Find the **volume** of the three-dimensional shape formed from this net.

3

[Turn over

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Marks	KU	RE

4. (*a*) Solve algebraically

$$5x - 2 = 2x + 19.$$

3

(*b*) Factorise fully

$$12 + 8p.$$

2

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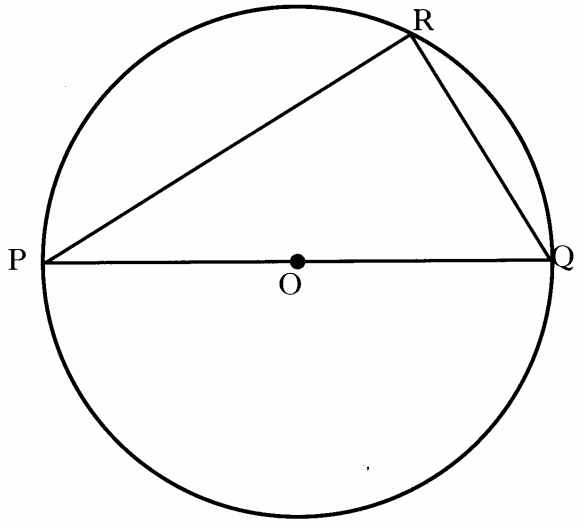
Marks | KU | RE

5.



PQ is a diameter of the circle with centre O.

R is a point on the circumference of the circle.

PR is 12 centimetres.

RQ is 5·5 centimetres.

Calculate the length of the radius of the circle.

4

[Turn over

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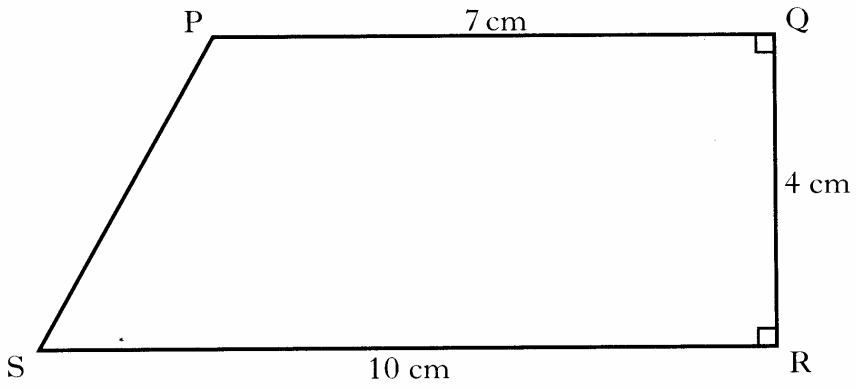
Marks | KU | RE

6.



PQRS is a trapezium.

- PQ = 7 centimetres.
- QR = 4 centimetres.
- SR = 10 centimetres.
- Angles PQR and QRS are both right angles.

Calculate the size of angle PSR.

Do not use a scale drawing.

4

DO NOT WRITE IN THIS MARGIN

Marks	KU	RE

7. (*a*) John is going to Italy on holiday.

He changes £500 to Euros.

The exchange rate is £1 = 1·51 Euros.

How many Euros will he get?

2

(*b*) While in Italy he decides to visit Switzerland for a day.

He wants to change 100 Euros to Swiss Francs.

John knows the exchange rate is £1 = 2·33 Swiss Francs.

How many Swiss Francs should he get for 100 Euros?

3

DO NOT WRITE IN THIS MARGIN

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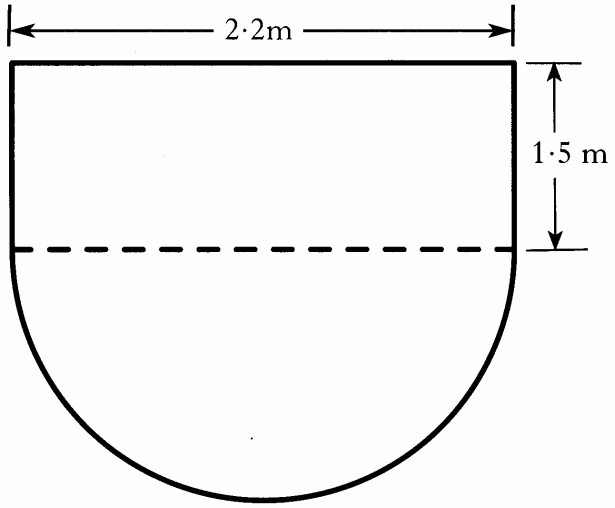
8. The floor of a conservatory consists of a rectangle and a semicircle.

The floor has the shape shown below.

The measurements are in metres.



Find the total area of the floor.

4

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9. A basic cable television package, which includes 30 channels, costs £8·75 per month.

The cost of installation is £75 which will be included in the first month's bill.

Additional channels can be added to the basic service.

- The movie channels package costs £12·50 per month.
- The music channels package costs £7·50 per month.
- The sports channels package costs £14·50 per month.

The Mackie family's first bill after having cable television installed was £98·25.

They chose the basic cable television package plus one additional channels package.

Which additional package did they choose?

Give a reason for your answer.

3

[Turn over

DO NOT WRITE IN THIS MARGIN

Marks | KU | RE

10. Janice is planning to go on holiday to Florida.

She wants to book with FloridaSun Holidays and stay at the Parkway Hotel.

The table below shows the pricing information for the Parkway Hotel.

FloridaSun Holidays PARKWAY HOTEL	Prices are per person in £s	
No. of Nights	**7**	**14**
May 17	445	725
24	459	735
31	465	749
June 7	479	765
14	499	779
21	509	789
28	519	799
July 5	525	805
12	535	825
19	545	839
26	609	855
Aug 2	615	869
9	625	895
16	639	875
23	539	845
30	519	805

(*a*) Janice wants to stay in the Parkway Hotel for 14 nights.

What will be the price if her holiday starts on 5th July?

1

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Marks | KU | RE

10. (continued)

(*b*) The Parkway Hotel charges an extra £4·95 per person per night for a single room.

How much extra will Janice pay for her 14 night holiday if she wants a single room?

1

(*c*) If Janice books today she will get a 20% discount on her **total cost**.

Find the discounted price of her 14 night holiday in a single room from 5th July.

2

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11. Mara travels 1850 miles every month.

Currently her car runs on unleaded petrol, which costs 76·9p per litre and her car travels 8·5 miles per litre.

(*a*) What is her monthly petrol bill?

2

Mara is thinking of having her car converted to run on Liquid Petroleum Gas (LPG).

LPG costs 38·9p per litre and using this fuel her car will travel 7·8 miles per litre.

(*b*) What will be her monthly saving if she converts her car to run on LPG?

2

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11. (continued)

(*c*) The cost of converting Mara's car to run on LPG is £800.

How many months of savings will it take to recover the cost of the conversion?

2

[Turn over

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12. The current, C amps, of an electrical appliance is calculated using the formula

$$C = \frac{P}{240},$$ where P watts is the power rating.

- A hairdryer has a power rating of 850 watts.
- The fuse used should be the one just bigger than the calculated current.
- The choice of fuses is 3 amp, 5 amp and 13 amp.

Which fuse should be used?

3

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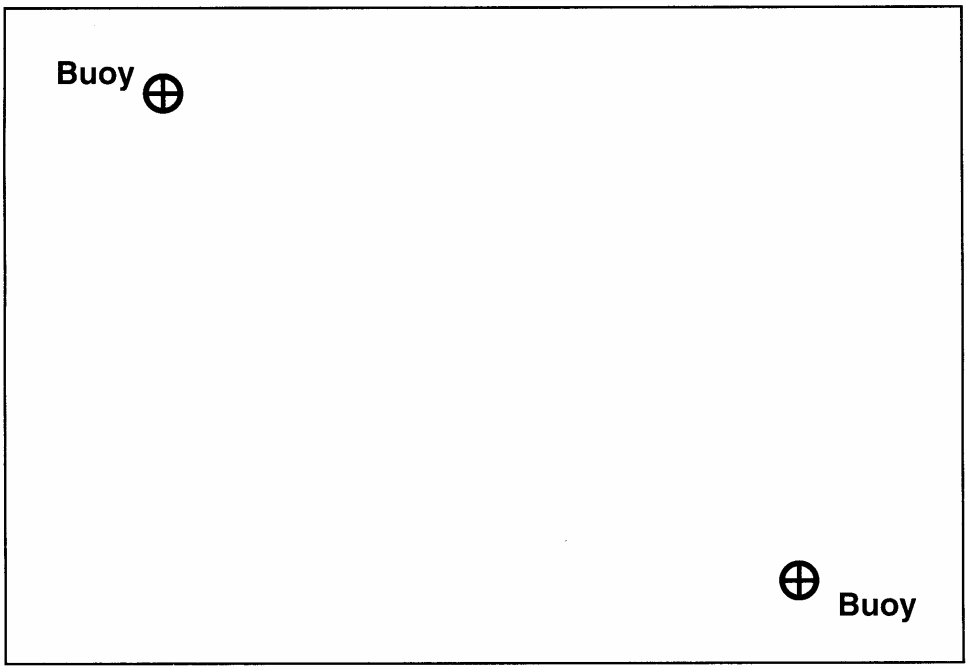
13. The diagram below shows the position of two buoys.

Sofie has to sail her yacht between the two buoys so that it is always the same distance from each buoy.

Show the yacht's **course** on the diagram.



2

[*END OF QUESTION PAPER*]