

## MATHEMATICS TEST

### Year 9 – Part C

After every item is given the maximum mark your solution can receive. (2/1) means that the item can give 2 g-points and 1 vg-point. Items marked with  $\square$  give you a possibility to show MVG-quality.

Most items demand full workings, which means that a single answer is not enough.

Only a correct answer gives no point, except for the items which are marked with *Only answer is requested*.

Your solution would be clear enough for another person to read and understand what you mean. It is important that you show *all* your workings. You can earn points for partially worked problems.

Tools: Calculator, ruler.

Test period: 80 minutes.

Name: \_\_\_\_\_

School: \_\_\_\_\_ Class: \_\_\_\_\_

Date of birth: Year \_\_\_\_\_ Month \_\_\_\_\_

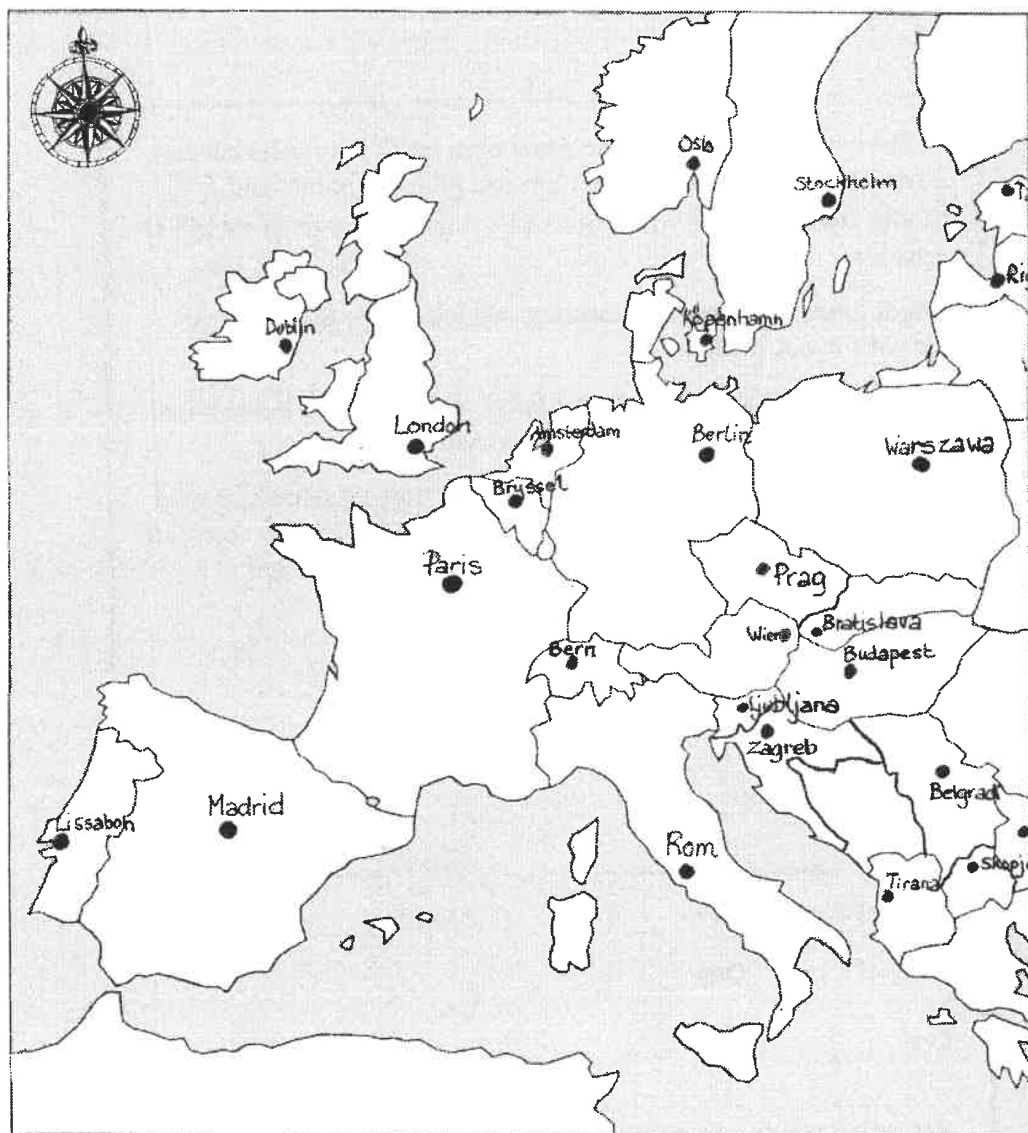
Day \_\_\_\_\_

Girl ☐ Boy ☐

*All calculations and answers should be written on paper that is handed in at the end of the test, except for item 10a. The test packet must be handed in with your solutions.*

## Part C

### *To interrail in Europe*



With an interrail card you may travel up and down through Europe during one month. The card also comes as a so-called zone card, where you choose in how many zones you want to travel. David and Oscar plan to interrail together in Europe the summer they both have had their eighteenth birthday.

1. David has got 800 kr from his grandmother to buy a backpack for the journey. He finds a good backpack that has cost 990 kr but is now sold with a discount of 20 %. Will the money from grandmother be enough for that backpack? (2/0)

They want to visit Germany, France and Great Britain. They have saved 8 000 kr each for the journey and think about for how long time they can afford to be away.

2. a) How much will the interrail card cost? *Only answer is requested.* (1/0)
- b) A simple accommodation for the night costs 100–180 kr per person. A reasonable food cost is 60–150 kr a day per person. Give a suggestion for how long time they can be away. Give a clear account for your calculations. (1/2)

Prices for interrail cards			
Type of card	Children 4–11	Young people 12–25	Adults 26–
1 zone 22 days	1 200:-	1 700:-	2 400:-
2 zones 1 month	1 550:-	2 200:-	3 100:-
3 zones 1 month	1 775:-	2 500:-	3 550:-
Europe all zones 1 month	2 000:-	2 800:-	4 000:-
Zones			
A: Great Britain and Ireland			
B: Norway and Finland			
C: Denmark, Germany, Switzerland and Austria			
D: Poland, the Czech Republic, Slovakia, Hungary and Croatia			
E: France, Belgium, Holland and Luxembourg			
F: Spain, Portugal and Morocco			
G: Italy, Slovenia, Greece, with the ADN/HML shipping company			
H: Serbia–Montenegro, Macedonia, Romania and Bulgaria			

They start the journey by taking the train to Copenhagen via the new Öresund Bridge. From there they go on to Hamburg by a train that leaves at 17.55 o'clock.

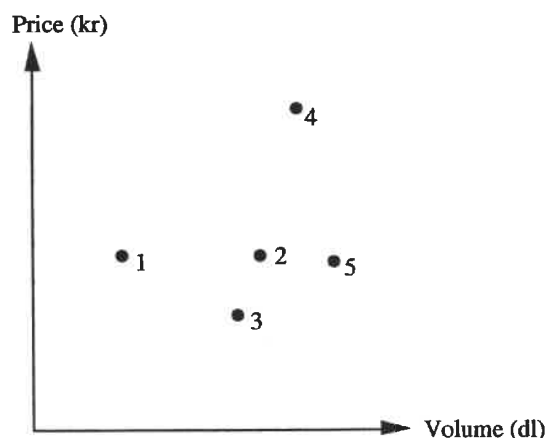
3. a) How long time will the journey to Hamburg take? (2/0)
- b) What average speed in km/h does the train keep between Lübeck and Hamburg? (1/2)

D 1 København–Hamburg

		A	B	C	D	E	F	G
		EC 36	EC 34	EC 32	EC 30	EC 32	EC 30	EC 30
km		IC3	IC3	IC3	IC3	IC3	IC3	IC3
0	fr København H	13.52	15.52	17.55	18.48	20.13	7.55	10.55
20	fr Høje Taastrup	14.06	16.06	18.08	19.03	20.30	8.08	11.08
40	fr Ringstad	14.29	16.29	18.30	19.30	21.02	8.30	11.30
153	fr Nykøbing F	15.16	17.16	19.16			9.16	12.16
190	t Rødby	15.37	17.37	19.37			9.37	12.37
	fr Rødby x							
209	fr Puttgarden	16.30	18.30	20.30			10.30	13.30
298	fr Lübeck Hbf	17.38	19.39	21.38			11.38	14.45
362	t Hamburg Hbf	18.15	20.15	22.15	0.41	2.14	12.15	15.24

It is hot in Hamburg and they need a lot to drink.

4. Oscar and David compare the prices on soft drinks. They buy five different bottles of different soft drink types. The diagram below shows the relation between volume and price for these different bottles (marked 1–5 in the diagram).



- a) Which bottle is the most expensive? *Only answer is requested.* (1/0)
- b) Two of the soft drink types cost just as much per decilitre. Which are they? Explain clearly why you have chosen these two. (0/2) x

The journey continues to Paris, where they amuse themselves a lot.

5. After a late night at the disco Oscar doesn't want to walk home so he takes a taxi. When he arrives the fare meter shows 132 francs. He pays the driver 150 francs. How many percents does he pay in tip?

(1/1)

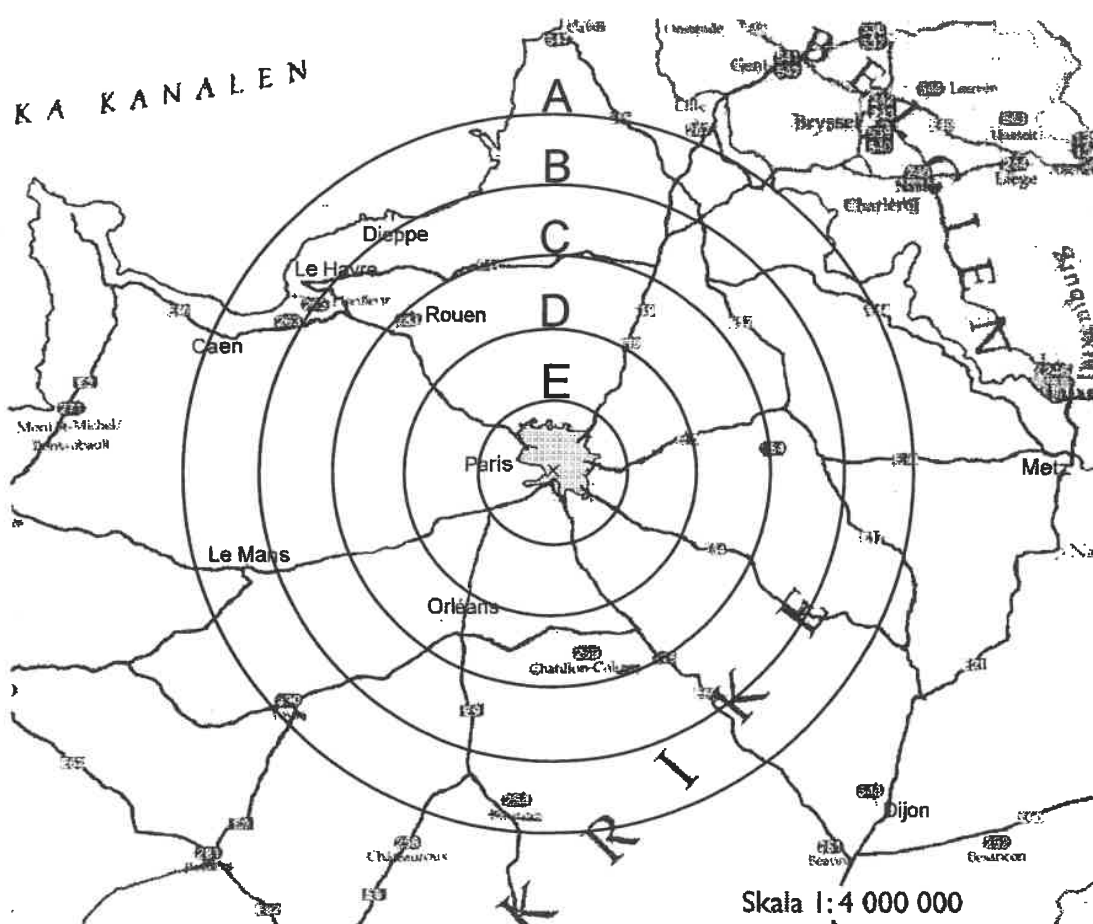
6. One day they visit the Eiffel Tower, which is 328 m tall and the tallest building in Europe. As a tourist you may come 300 m up in the tower. From there in a fair weather you can see 80 km in all directions.

- a) On the map below some circles are drawn. Which one of these circles shows the area that can be seen from the Eiffel Tower? Motivate your answer with calculations.

(1/1)

- b) The area of France is 547 000 km<sup>2</sup>. The guide says that you can see about one tenth of France from the Eiffel Tower. This is not correct. What should the guide have said instead?

(1/2) ✖



After the life in the big city the journey continues to the French countryside. They stay for a few nights in a small town in Normandy. There they rent bicycles to be able to look around in the surroundings.

7. David and Oscar want to visit the town of Bayeux. When they start their bicycle trip towards Bayeux they see the following sign, with the distances given in kilometres:



After 40 minutes this sign appears:



On the new sign Bayeux is not to be found. David gets worried and says that they have passed the town. Oscar says that they will arrive in ten minutes if they keep the same speed, since they have not passed any side road. Investigate if Oscar is right.

(1/1)

The next destination is London. They get a lift with a beautiful Frenchwoman to Calais, where they will take the ferry over to Dover in England.

8. They know that the ferries leave at intervals of two hours but they have no timetable. What is the probability that they will have to wait half an hour or more?

(0/2)

Having reached London they look for a place to stay.

9. The room they rent is a basement room on  $12 \text{ m}^2$ . Outside the window they have a backyard. When they come home, after a rainy night, a lot of water has flown into their room. They estimate that the room has been filled up to a height of about 30 cm. "All the rain water from the backyard must have found its way into our very room", David sighs. Find out if he is right. 12 mm of rain had fallen during the night and the backyard is a rectangle with the sides 20 m and 30 m.

(2/2) ✖

On their home journey they read about the countries of Europe in a guide book. There the following table is found:

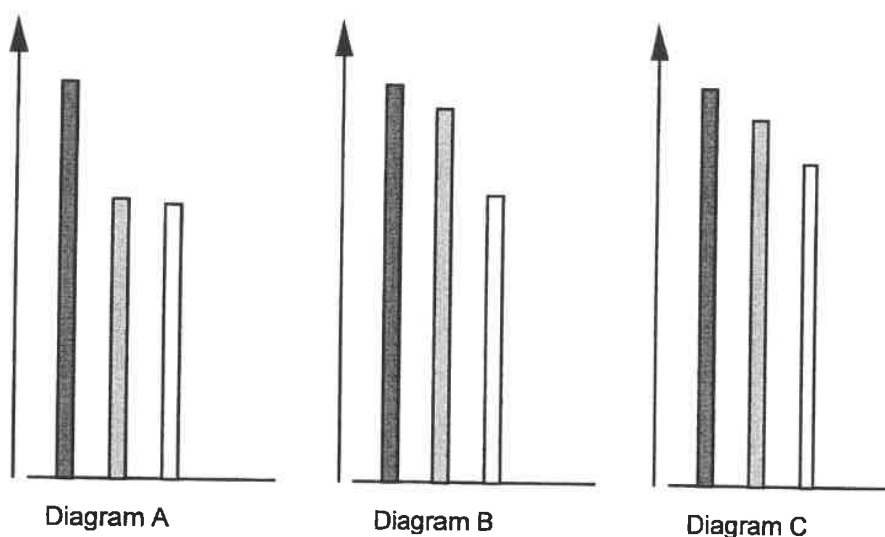
**Population and area for 12 of the European Countries**

	Population (milj)	Area (1 000 km <sup>2</sup> )
Belgium	10.2	31
The Check Republic	10.3	79
Denmark	5.3	43
Finland	5.1	337
France	58.6	547
Germany	82.1	357
Great Britain	57.6	245
Italy	56.8	301
The Netherlands	15.7	37
Norway	4.4	324
Spain	39.1	505
Sweden	8.9	450

They discuss which one of the countries that is the largest. Well, that depends upon if you look at the area of the country or at its population.

10. a) Choose the diagram, that shows the three largest countries with *respect to the area*. Mark the names of the countries at the bars.

(1/1)



- b) The Netherlands has the highest population density. How many people would live in Sweden if we had the same population density as the Netherlands?

(1/1)