

SUBJECT TEST

Mathematics

GRADE

9

Tests which are re-used are protected by paragraph 3 of Chapter 4 of the Official Secrets Act.

The intention is for this test to be re-used until **2018-06-30**.

This should be considered when determining the applicability of the Official Secrets Act.

Spring 2012

Part C

Name

Instructions – Part C

Complete solutions are required for nearly all questions.

Complete solution means that your solution must be clear enough so that other persons may easily read and understand what you mean. It is important that you present all your work. You may get some points, even for a partial solution.

A mere answer does not give any points except for question 2 and 8a marked *Only answer is required*.

After each question the maximum total number of points possible for your solution is shown. For example (2/1) indicates that the question can give a maximum of 2 g-points and 1 vg-point. You may demonstrate MVG-qualities in your solutions to questions marked with the symbol \square .

Aids: Access to calculator and formula page.

Time: 100 minutes.

Name: _____

School: _____ Class: _____

Birth date: Year _____ Month _____ Day _____

Female ☐ Male ☐

Solutions and answers must be written on separate paper, not on this question paper. The question paper must be handed in, together with your solution.

Illustrations: Jens Ahlbom

Since ancient times, the Sami have lived in a region overlapping on four different countries. This region is called Sápmi or Sameland. Sameland includes northernmost parts of Norway, Sweden, Finland and Russia (the red part in the map). The Sames have their own language and about 10 % of the Sami still live by reindeer herding.

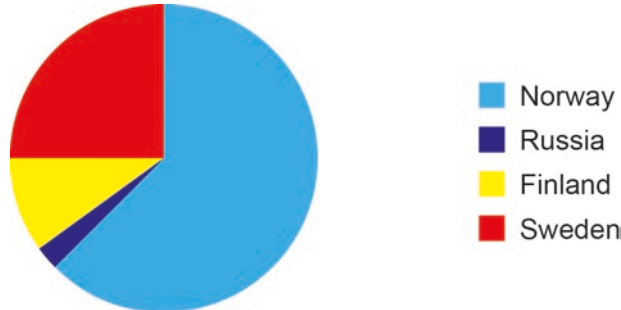


Foto: Kaisa Siren/Scanpix

1. In Sweden there are 51 Sami villages and 260 000 reindeer. About how many reindeer per Sami village are there?

(1/0)

2.



The diagram shows the distribution of Sami in Sweden, Norway, Finland and Russia. About 20 000 Sami people live in Sweden. About how many Sami are there in total? *Only answer is required.*

(1/0)

3. The area of Sameland is 388 350 km². The area of Sweden is 449 960 km². By what percentage is Sweden larger than Sameland?

(1/1)

Göta Canal is one of the biggest engineering projects ever carried out in Sweden. The entire stretch from Lake Vänern to the Baltic Sea is called Göta Canal.



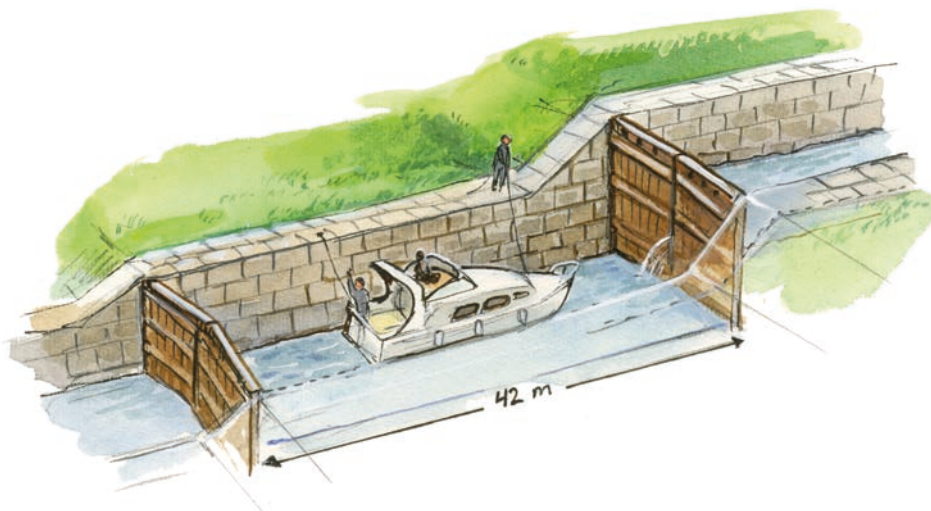
4. Göta Canal is 190 km long and has 58 locks. Approximately 60 000 men worked for 22 years on the construction of the canal. 87 km of the total stretch was dug by hand with wooden shovels. What percentage of the canal's length was dug out using wooden shovels?



(2/0)

5. A lock is a kind of staircase for boats. The boat lies in one lock chamber and the water level in this chamber is raised by pumping water into the chamber. One such particular chamber is 42 m long and 8.1 m wide (see picture). How much water is pumped into the chamber for one lift if the water level rises by 2.9 m?

(2/0)



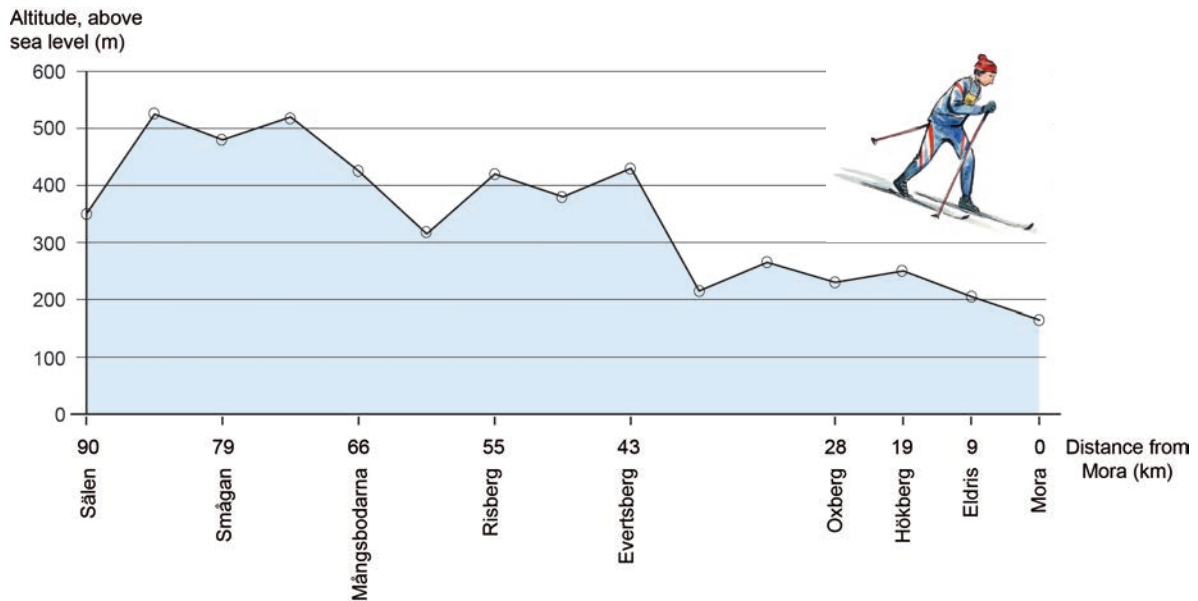


6. a) 100 people are gathered on Midsummer Eve to dance a ring dance around the Midsummer pole. Each person's arm span from hand to hand is about 120 cm, on the average. What will the diameter of the ring of dancers be if they form *one big ring*? (2/0)
- b) Make a suggestion for how it might look if the dancers formed *two rings*, one inner ring and one outer ring. What would the diameters be for these two rings? (1/2)

7. Maria sold ice cream (glass) at a kiosk at the Midsummer celebration. She sold cones for 18 kr each and cups for 15 kr. Altogether she sold 350 ice creams and took in a total of 6 000 kr. How many ice creams of each kind did she sell?



(1/2) ✖



The diagram shows the cross-section profile for the Vasa ski race, i.e. the altitude above sea level for the various places along the trail. The Vasa ski race starts in Sälen and finishes in Mora.

8. a) How far have you skied from Sälen when you get to Evertsberg?
Only answer is required. (1/0)
- b) What is the difference in altitude between the highest and the lowest points of the ski trail? (2/0)
- c) In 2011 Jörgen Brink won the Vasa ski race with a time of 3 h 51 min 51 s. The first Vasa ski race in 1922 was won by Ernst Alm with a time of 7 h 32 min 49 s. How much shorter was the race time for Jörgen Brink compared to Ernst Alm? (1/2)
- d) What was the average speed in km/h for Jörgen Brink in the 2011 race? (1/1)
- ✖
9. During the week of the Vasa ski race in 2011, 58 850 skiers had registered. That was an increase of 25 % compared to 2007. How many had registered in 2007? (0/2)

10. In archaeological excavations, many skeletons parts have been found. Using the length of the thigh-bone (x cm) it is possible to determine approximately how tall the person probably was when he was living.

Body length (L cm) can be calculated using the formula:

$$L = 2.6x + 65$$

- Use this formula to calculate the body length for a person whose thigh-bone was 35 cm long.
- Sweden's tallest man Gustav Edman was 242 cm in length. What was the length of his thigh-bone, according to the formula?
- Investigate whether the formula can hold for small children.



(2/0)

(1/1)

(0/2) ✖

11. The sections of the Swedish flag have the length proportions 5:2:9 on the long side and 4:2:4 on the short side. The yellow cross has the same width everywhere (see figure).

- Anton has a Swedish flag at the back of his boat. The yellow cross has a width of 12 cm on Anton's flag. What is the length and width of Anton's flag?
- An unusually big Swedish flag has an area of 90 m². Find the length and width of this flag?

(1/1)

(0/2) ✖

