

This material is confidential until the end of April 1998.

Directions

Test period	December 5 - December 18, 1998.
Test time	120 minutes without a break.
Resources	Calculator and formula sheet. The formula sheet is attached to the test.
Test material	The test material should be handed in with your solutions. Write your name, gymnasium programme/adult education and date of birth on the papers you hand in.
The test	The test is made up of 11 problems. Most of the problems are long-answer problems, where a short answer is not sufficient, but it is required • that you write down what you do • that you explain your train of thought • that you draw figures when necessary. Some of the problems (where it is stated "<i>Requires only an answer</i>") need only an answer. Try all of the problems. It can be relatively easy, even at the end of the test, to earn some points for a partial solution or presentation.
The grading levels	The teacher responsible will explain the score levels which are required for "Passed" and "Passed with Distinction". It is possible to earn a maximum of 40 points in the test.

1. Calculate

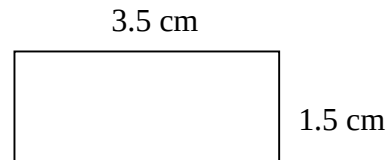
a) $(1 + 3.2) \cdot 4.78$

Requires only an answer (1p)

b) $\frac{651}{7.9 + 9.46}$

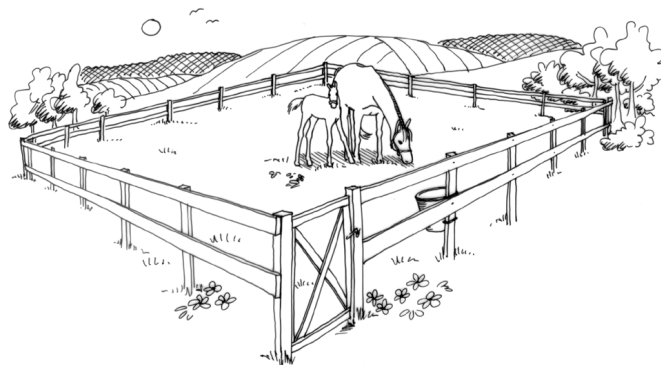
Requires only an answer (1p)

2. The figure to the right shows an enclosed pasture, drawn to scale 1:1000.



a) How much fencing is needed to enclose the pasture? (2p)

b) What is the area of the enclosed pasture? (2p)



3. On Friday morning you phone Eva in the next block. No one answers so you call her up on her mobile phone, where she answers. You talk for 15 minutes. How much more does this call cost than if Eva had answered her "ordinary" phone at home.

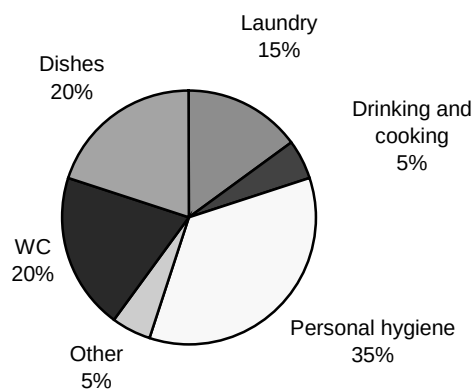
Use the price list below.

(2p)

Charge for calls	
Local calls (no area code)	20 öre/min*
National calls (to other area codes)	50 öre/min*
*Half the charge weekdays 6 pm - 8 am, weekends and holidays.	
Calls to mobile phones, Mo - Fri 8 am - 6 pm	4.31 SEK/min
evenings, nights and weekends	2.88 SEK/min

4. a) Find the number that is midway between 100 000 and 1 000 000
Requires only an answer (1p)
- b) Find a number that is greater than $2.5 \cdot 10^{-3}$ but less than $2.5 \cdot 10^{-2}$.
Requires only an answer (1p)

5. During 24 hours, a person in Sweden uses on average 210 litres of tap water. The price for one litre of water is 1.5 öre. The water is used in the following way:



- a) How many litres of water does one person use for the WC during 24 hours?
Requires only an answer (1p)
- b) How much money do you save annually if you halve your consumption of water by using a low-water usage toilet? (2p)
- c) In words, describe shortly how the pie chart would change if the water consumption to the WC decreases. (1p)

6. The Anderssons go to a place where they can pick their own strawberries. They are all given similar buckets to pick in. When they have finished picking, the buckets with strawberries are weighed. The seller knows the weight of an empty bucket, so they pay for the strawberries only.
The table below shows the weights and prices of their buckets.

	Weight of bucket with strawberries	Price
Dad's bucket	5.2 kg	98 SEK
Mum's bucket	6.0 kg	114 SEK
Kalle's bucket	3.1 kg	56 SEK
Lillian's bucket	2.0 kg	34 SEK

When they come home, they pick over the strawberries and eat some of them. They are going to make jam of the rest of the berries.

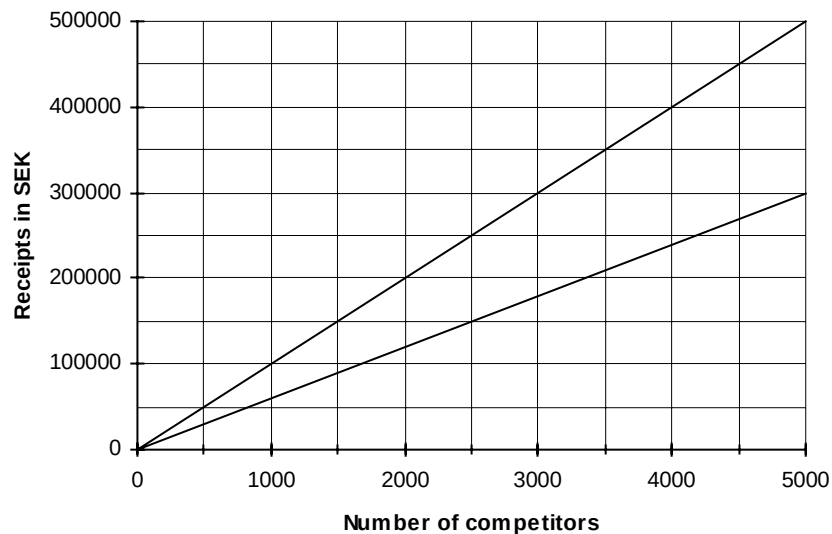
- Illustrate the relationship between weight and price in a chart. (3p)
 - What is the weight of an empty bucket? (2p)
 - What is the price of the strawberries per kilogram? (2p)
7. Solve the equation $10x - 15 = 5x + 20$ (2p)

8. The table below shows the distribution of age groups of the employees in two companies.

Age group	Company A		Company B	
	Number	Percentage	Number	Percentage
- Age 25	25	35%	659	54%
Age 26 - 50	36	51%	431	35%
Age 51 -	10	14%	134	11%
Totalt	71	100%	1224	100%

- Which of these companies has the largest share of employees over age 25? Justify your answer. (1p)
- Which of these companies has the lowest median age? Justify your answer. (1p)
- Explain why you cannot calculate the average age of the employees by using the table. (1p)

9. In the competition "Prejoggen" all competitors pay an entrance-stake. The entrance-stake is higher if you are a senior than if you are a junior. The chart shows how the income from each of the two groups depends on the number of competitors.



- a) What is the entrance-stake for a senior and what is the entrance-stake for a junior? (2p)
- b) The arranger can admit 5000 competitors maximally. Create a formula that describes how much money the arrangers make if the maximal number of competitors announce themselves, and x of them are juniors (2p)
10. Peter and Karin are going to buy a used car. Karin likes a French car which costs 114 000 SEK. Peter claims that the value of this type of car decreases yearly with approximately 11%. Peter and Karin think about how much this car would be worth in 3 years, and they each calculate the value.

Peter's calculation:

$$\begin{aligned}
 3 \cdot 0,11 &= 0,33 \\
 1 - 0,33 &= 0,67 \\
 0,67 \cdot 114000 &= 76380 \text{ kr}
 \end{aligned}$$

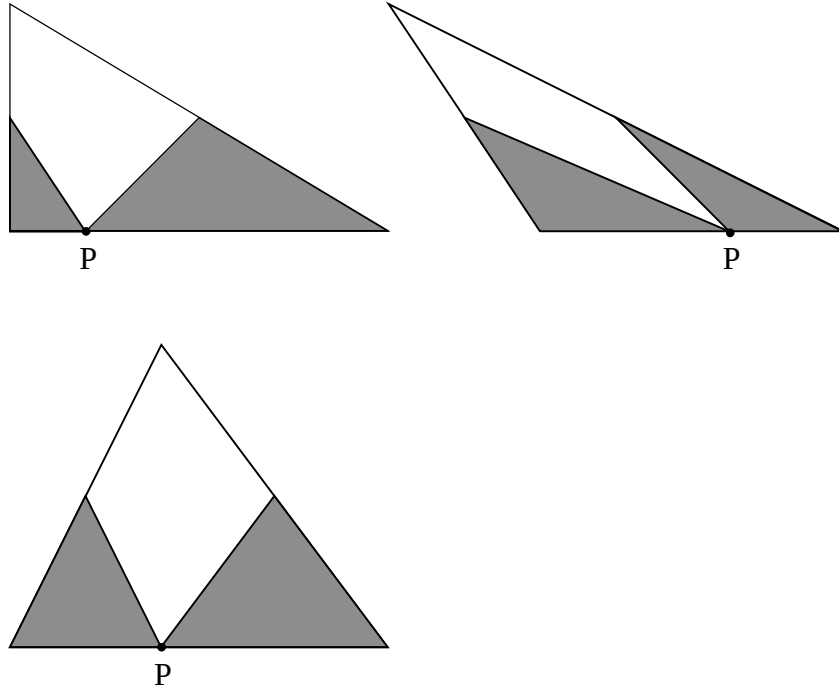
Karin's calculation:

$$\begin{aligned}
 1 - 0,11 &= 0,89 \\
 0,89^3 \cdot 114000 \text{ kr} &\approx 80366 \text{ kr}
 \end{aligned}$$

Who has interpreted the problem correctly? Justify your answer by describing how Peter and Karin may have reasoned.

(3p)

11. In the triangles below, lines have been drawn from a point P on the base to the mid-points on the two other sides.



- a) In each of these triangles, examine the relationship between the area of the whole triangle and the sum of the grey-shaded areas. Please use a ruler. What can you conclude from this? (3p)
- b) Show that your conclusion is valid for all shapes and sizes of triangles, and for all positions of P. (4p)