

Instructions – Part II

Time 120 minutes for Part II.

Aids Calculator, approved formula page and ruler.

Part II Part II consists of 10 questions. Most of the questions require not only an answer, you must also

- write your solutions
- explain your line of thought and reasoning so that it is easy to follow
- draw clear figures when needed.

Some questions require only answer. These are indicated by the text *Only answer is required*.

After each question the maximum number of points available for your solution is shown. For example (2/1) indicates that the question can give 2 g-points and 1 vg-point.

In questions marked $\boxtimes$ you have an opportunity to demonstrate MVG-quality. This means that you use general methods, models and reasoning, that you analyse your results and present a clear line of thought with correct mathematical language.

Grading The test (Part I + Part II) gives a total maximum of 59 points, of which 23 are vg-points.

Lower limits for examination grade

Pass: 20 points.

Pass with distinction: 36 points of which at least 9 vg-points.

Pass with special distinction: At least 16 vg-points. In addition you must demonstrate several of the MVG-qualities that are possible to show in the questions marked $\boxtimes$.

**Write your name, date of birth, and adult education/
secondary school program on the papers your hand in.**

Illustrations: Jens Ahlbom

1. Human hair grows about 0.35 mm/day.

a) About how much does a strand of hair grow in a month? (1/0)

b) One strand of Adam's hair is 5.6 cm long. How long does it take until that hair strand will be twice as long? (2/0)

2. The table shows when the sun rises and sets at different places in Sweden on June 6.

June 6			
Place	Sun rises	Sun sets	Daylight (hours the sun is up)
Kiruna	Sun never sets – polar daytime		
Luleå	01:23	23:36	
Göteborg	04:12	22:08	17 h 56 min
Malmö	04:25	21:48	

a) How long is the sun up in Luleå on June 6? *Only answer is required.* (1/0)

b) How much longer is the sun up in Luleå compared to Malmö on June 6? (2/0)



3. An offer from a cell phone company looks like this:

Mobile Company

49 kr as fixed monthly charge

69 öre/call in opening charge

69 öre/minute all day, every day

Free sms



- a) Ebba has a cell phone contract with the Mobile Company. When she got her first bill it contained this information:

Number of calls	Length of call in minutes
72	183

Ebbas bill for the month was 224,95 kr. Show by calculations that this amount is correct.

(2/0)

- b) Rebecca also has her cell phone contract with Mobile Company. Her bill for the month was 198,73 kr. She knows that she made 40 calls. How many minutes was Rebecca's total calling time?

(1/1)

- c) Another month both Ebba and Rebecca had a total calling time of 221 minutes but their bills were different. Explain why.

(1/0)

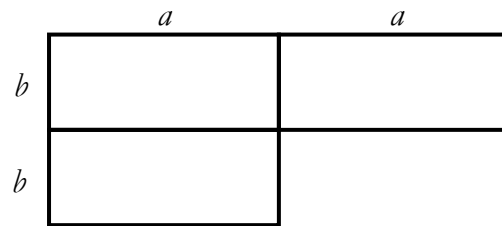
4. According to a book of records the shortest man ever was only 57 cm tall and the tallest man was 272 cm. The average height for men in Sweden in the age group 16–84 years is 179 cm.

The length of the figure drawn below is 5.0 cm, and represents a man of average height. If you want to draw the shortest and the tallest man in the same scale, how long would these two figures be?



(2/1)

5. The figure shows a region consisting of three rectangles. Both a and b are *positive integers* and they indicate the lengths of the sides.



- a) Write an expression for the perimeter of the entire region.
Only answer is required. (1/0)
- b) Investigate the area of the entire region if the perimeter is 28 meter. (1/2)

6. In a language course there were 16 participants. Of these, 10 persons paid full price while 2 persons got a 25 % discount on the course fee since they had participated in other courses. Four persons were under 18 and paid half price. In total the participants paid 16 200 kr. How much did young people under 18 pay as course fee? (1/1) ✖

7. The tables show some of the pairs of numbers for two functions.

Table 1.

x	0	2	3	4
y	0	4	6	8

Table 2.

x	0	2	3	4
y	3	5	6	7

- a) Draw the graphs for both functions in *the same* coordinate system.
- b) Describe similarities and differences between the functions. Use words from the Word list.

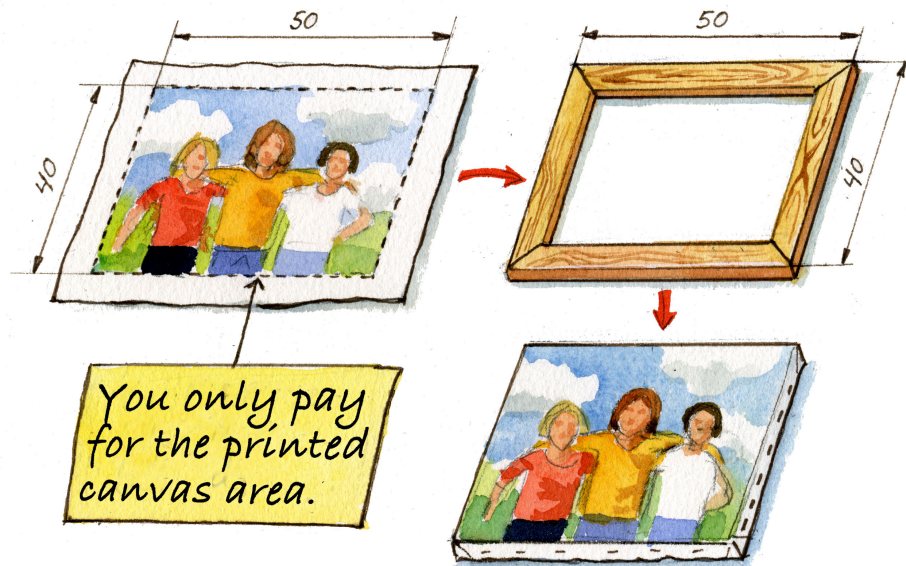
Word list

- Linear function
- Origin
- Proportionality

(2/0)

(1/1)

8. In a photo shop they make rectangular pictures on a painting canvas and then mount the picture on a wooden frame. This frame costs 0.45 kr/cm. The painting canvas costs 0.12 kr/cm² and the mounting cost is 169 kr for all sizes.

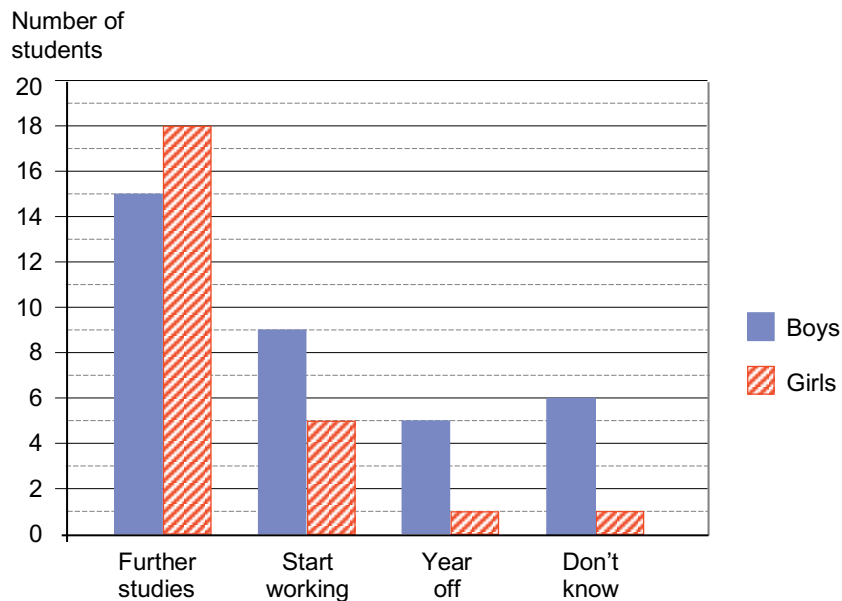


- a) Linda wants to have a picture printed and mounted. She wants the picture to be 50 cm long and 40 cm wide. What will this mounted picture cost?
- b) In order to calculate the price for mounted pictures the shop workers need a formula which includes the length and the width. The price must also include the printed canvas, the frame and the mounting cost. Help the photo shop to make this formula.

(2/1)

(1/1) ✖

9. The diagram below presents the result of a survey done in two graduating classes in a secondary school. The students had answered the question: “What do you intend to do after your graduation?”



A newspaper article presented the survey and stated:

”More than 50 % of the students intend to do further studies. The proportion of the girls who intend to study is 68 % greater than the proportion of the boys who intend to study.”

Using your own calculations show that the journalist has made correct percent calculations.

(2/2) ✖

10. The figure below shows a circle and a right-angled triangle. The radius of the circle is the same as the height of the triangle. If the circle rotates one revolution, the distance covered corresponds to the base of the triangle. Pythagoras claimed that the area of the circle and the area of the triangle are always the same. Show that his claim is correct.

The figure is not drawn in scale.

(0/2) ✖

