This material is confidential until the end of March 1997.

## Directions

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|---|---|
| Test period | Nov 27 - Dec 18, 1996. |
| 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.<br><br>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 12 problems.<br><br>Most of the problems are of long-answer problems, where it is not enough with a short answer, but requires<br>• that you write down what you do<br>• that you explain your train of thought<br>• that you draw figures when necessary.<br><br>Some of the problems (where it is stated ”Only an answer is required”) need only an answer.<br><br>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 techer responsible will explain the grade levels which are required for ”Passed” and ”Passed with Distinction”. It is possible to earn a maximum of 53 points in the test. |

**1.** a) Compute $24 - 6.2(7.8 - 3.95)$ *Only an answer is required.* (1p)

b) Compute $\dfrac{2.2^4}{1.2^3}$ *Only an answer is required.* (1p)

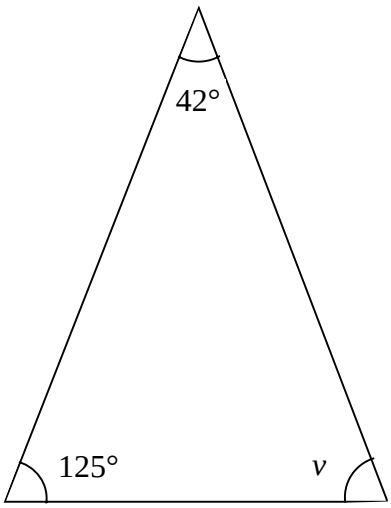
**2** a) Compute the value of the expression $42 - 4x$ when $x = 2$ (1p)

b) Sole the equation $14 = 42 - 4x$ (2p)

**3.** Here are six numbers: 0, 2, 3, 5, 7 och 9.
These numbers can be reorganized to form different six digit numbers, for example 795 320.
Construct the number which lies as close to 300 000 as possible. *Only an answer is required.* (1p)

**4.** a) In a triangel, there are two angles with measures of 125° and 42°.
Compute the triangle´s third angle. (1p)

b) Describe the mistake which was made when this figure was drawn. (1p)

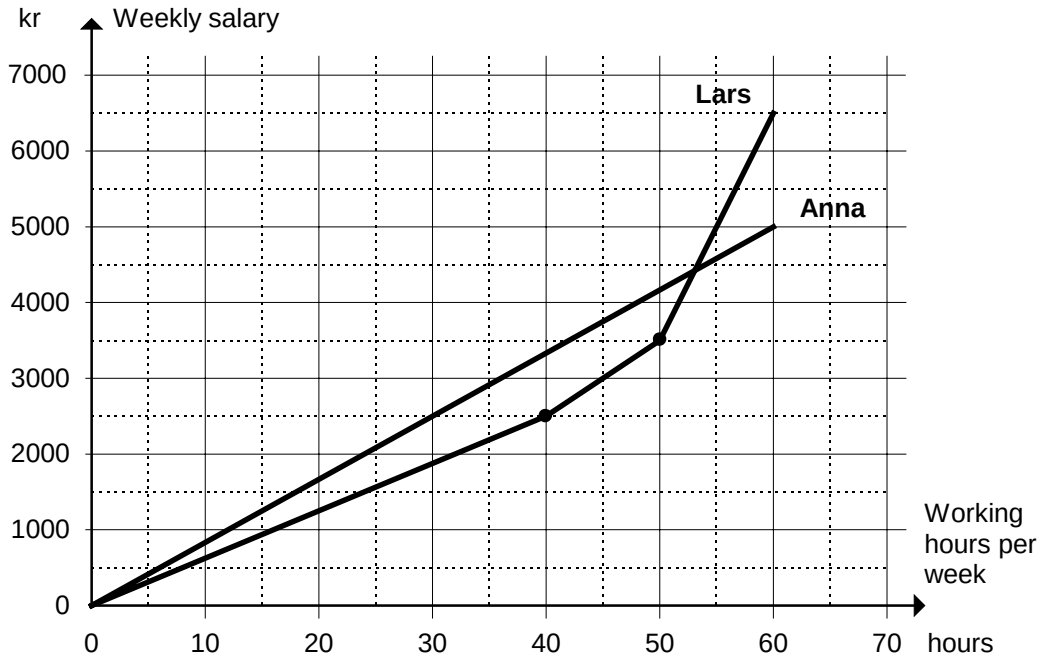



**5.** Eva is planning her new bedroom by drawing a sketch in a scale of 1:50.

a) Eva´s bed is 210 cm long.
How long is the bed in her sketch? (1p)

b) The bedroom has an area of 10.5 $m^2$.
Draw a scaled sketch (scale 1:50) of how Eva´s bedroom might look. (3p)

**6.**




The working time in one company varies between 40 and 60 hours a week. The employees can choose between two different types of salary plan. Anna and Lars choose different types. Their salaries are shown in the diagram.

a) How much does Anna make in one week if she works 40 hours? (1p)

b) How many hours does Lars have to work in order to have higher weekly salary than Anna? (1p)

c) What is Lars´ average pay per hour if he works 55 hours? (2p)

d) Describe as much as you can about the salary plan Lars has chosen. (2p)

**7.** In the evening after the ”school jog”, Per (8 years old) and his big sister Åsa (16 years old) began to fight about who had run the fastest.
Per ran 2.2 km in 12 minutes and Åsa 5 km in 30 minutes.

a) Who ran the fastest? Compare Per´s average speed with Åsa´s. (2p)

b) Åsa took her middle time after 1.2 km. It was 6 minutes.
Who do you think would have come first if they both had run 2.2 km? (2p)
Remember to motivate your answer.

**8.** You fill a thermos with coffee. In this thermos, the temperature drops with 12% during every 2-hour period. That is valid for 8 hours from when the thermos is filled with warm liquid.

a) Copy the table below onto your answer sheet and fill in the temperatures which are missing. (2p)

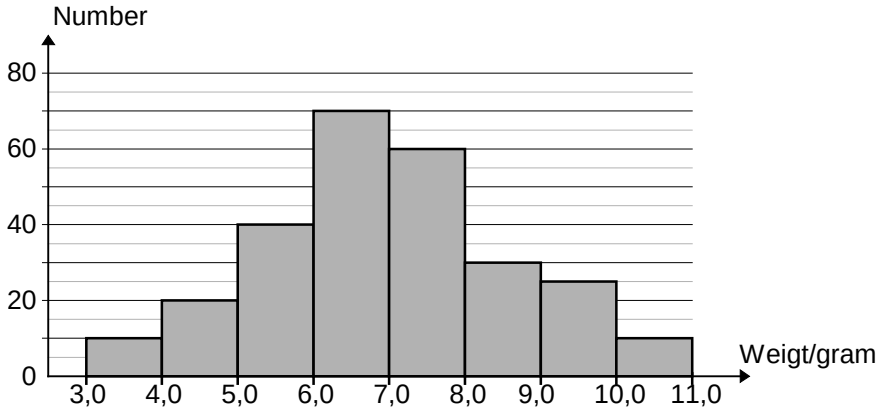
| **Time (hours)** | **Temperature (°C)** |
|---|---|
| **0** | 85 |
| **2.0** | |
| **4.0** | |
| **6.0** | |
| **8.0** | |

b) Draw a diagram which shows how the temperature of the coffee $y$ °C varies with time $x$ in hours. (2p)

c) Determine the temperature of the coffee after 7 hours using the diagram. (1p)

d) Pelle says that you can compute the change in temperature per hour by dividing 12% with 2.
Is he right or wrong? Remember to motivate your answer. (2p)

**9.** The result from a weight control of shrimps is presented in the diagram below.




a) How many shrimps weighed less than 5.0 g? (1p)

b) What percent of the shrimps weighed between 6.0 and 7.0 g? (2p)

c) A package with 500 g Luxury shrimps contains 50 - 70 shrimps.
About what percent of the shrimps, weighed for control, can be sold as Luxury shrimps? (2p)

d) Shrimps which weigh less than 4.5 g are used for preservation.
About what fraction is that? (1p)

**10.**

## Chocolate ball was for 17 000

Probably the worlds´s largest chocolate ball was produced by Åhlens´ bakery in Umeå. It was shown at Rådhus Square in June of 1988. The record ball was produced to celebrate the city of Umeå, which was 350 years old. It was made up of 135 kg of butter, 180 kg of sugar, 162 kg of oatmeal, 22.5 kg of cocoa, 2.7 kg of vanilla, 2.7 kg of mocha. During the day, 17 000 chocolate lovers got a taste.

The world´s longest Swiss roll, 2 053 meters long, was produced by bakery of Konsum in connection with the People´s Forum of Umeå in 1989. The cake was decorated with butter cream. It was sold in 25 cm pieces. The proceeds went to a forest project in Kenya. The Swiss roll took 10 people 400 hours to bake.

The text above was placed on a milk carton from the dairy ”Norrmejerier”. Use the information to answer the following questions.

a) Each piece of Swiss roll was sold for 20 kr.
How much money was collected in all? (2p)

b) With the ingredients, each $dm^3$ of the finished chocolate ball weighed 1.0 kg.
How large was its volume? (2p)

c) The Swiss roll is in the form of a cylinder. A dissection straight trough the cake produces a circular shape with a diameter of 7 cm.
Which had the largest volume the Swiss roll or the chocolate ball? (3p)

d) We assume that the finished chocolate ball was sphere shaped.
What was the diameter? (3p)

**11.** Rectangles with $\frac{width}{heigth} = \frac{2}{1+\sqrt{5}}$ are usually called golden rectangles.
Through the years, such rectangles have been viewed as having especially attractive proportions. Houses, parks, paintings and patterns are often constructed in this way.

a) Compute $\frac{2}{1+\sqrt{5}}$ and answer using two decimal points.

*Only an answer is required.* (1p)

b) Compute the heigth of a golden rectangle with a width of 5.0 dm. (2p)

c) State the formula for a computation of the area of a golden rectangle with a width of *b*. (2p)

**12.** Katarina says: (3p)
*- I can compute the triangle´s area if I know the angle between two sides of which I know the lengths.*
She is given the angle and solves the problem correctly.
Describe how you would do this.