This material is confidential until the end of November 1997.

Directions

Test period	April 11 - June 2, 1997.
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 10 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 ”Answer required only”) 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 techer responsible will explain the grade levels which are required for ”Passed” and ”Passed with Distinction”. It is possible to earn a maximum of 52 points in the test.

1. a) Calculate 24% out of SEK 2400. *Answer required only* (1p)

b) How many per cent are 47 mm out of 2937 mm? *Answer required only* (1p)

2. Anna is going to make blackcurrent jam. Her recipe contains the following ingredients:

1 kg blackcurrent
750 g sugar
2.5 dl water

When Anna has picked and topped the berries she establishes their weight to be 800 g.
How much sugar and water must she use to make the jam? (2p)

3. When in learning for a driver's license at *Roy and Roger's Driving School* the theory lessons and the obligatory driving lesson together cost SEK 2300. An extra driving lesson costs SEK 220 each time.

a) How much has Lars to pay all together to the driving school if he has twelve extra driving lessons? (2p)

b) Sara has just got her driver's license. She paid a total of SEK 4060 to the driving school. How many extra driving lessons did she have? (2p)

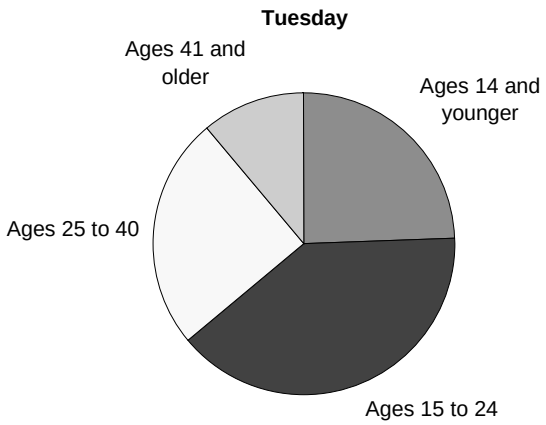
c) Make a formula that describes how much you have to pay all together to the driving school if you take a complete course for a driver's license and have x extra driving lessons. (2p)

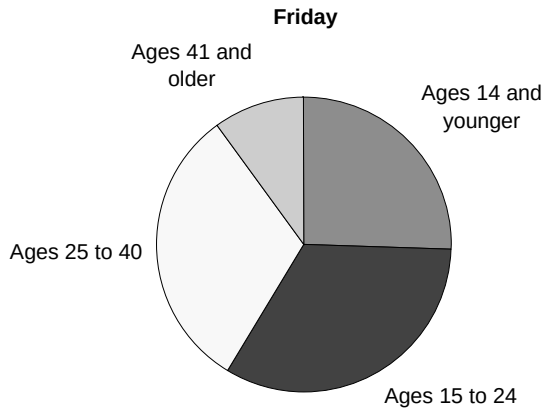
4. a) Give a *decimal number* and a *quotient of integers* which both are between $\frac{1}{4}$ and $\frac{1}{3}$. *Answer required only* (2p)

b) Which of the numbers 0.3333 and $\frac{1}{3}$ is bigger? Explain why. (2p)

5. Some Media-students in Norrköping have done a survey regarding the cinema habits of people. Among other things, they found out how many visitors the theatre *Filmstaden* had different nights. One question had to do with the age of the interviewed person. The age distribution regarding Tuesday and Friday night are shown in the pie charts below.

There were 120 people interviewed on Tuesday evening, and 240 people on Friday evening.





a) About *how many per cent* of the interviewed people on Tuesday were younger than 15? *Answer required only* (1p)

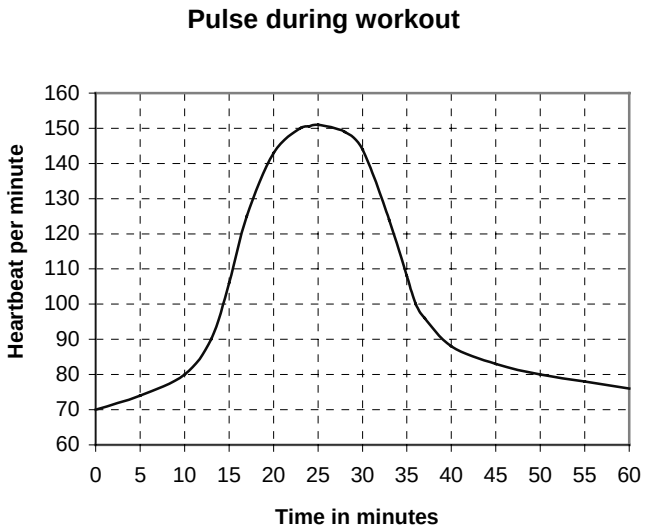
b) About *how many* of those interviewed on Tuesday were younger than 15? *Answer required only* (1p)

c) Annika was asked: "How many of those who were interviewed on Friday night were younger than 15?"
She answered: "The charts show that they were about as many as on Tuesday night."
Explain why the charts does *not* show that. (2p)

d) If the pie chart that shows the results from Friday night had been drawn with a radius 1.4 times bigger than that of Tuesday night, the charts would give more information. How come? (4p)

6. In a family there are five children of which four are girls. The average age of the siblings is 14 years. The boy is 18 years old. What is the average age of the girls? (3p)

7. An aerobic workout session begins with the warm-up phase which is followed by more intense exercises. During a session Mikael's pulse varies according to the following chart:



a) How much time has elapsed when Mikael's pulse peaks?
Answer required only (1p)

b) For how long is his pulse higher than 120 heartbeats/minute?
Answer required only (1p)

c) After the warm-up phase more intense exercises follow, which increase the pulse considerably. How can you make out when this happens from the chart, and how much does Mikael's pulse increase during the warm-up phase? (2p)

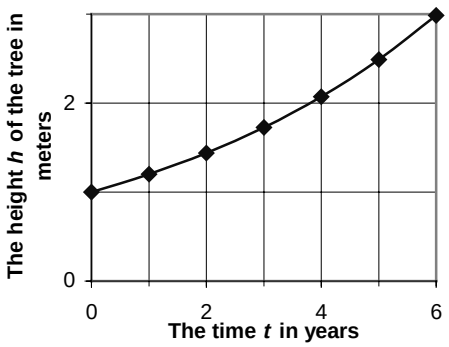
d) Mikael claims that his heart beats 3000 times during the intense part of the workout.
Use the chart to examine whether his statement is plausible. (3p)

8. Joakim is about to build a terrace measuring 3.40 m × 4.95 m next to his house. He will then cover the surface with concrete pavement tiles with the size 30 cm × 30 cm. These will be laid on a 15 cm thick layer of sand and with a small space in between them.

a) How many m^3 of sand should Joakim buy? (3p)

b) Joakim bought 180 concrete tiles. His mind is set to cover the terrace with *intact* tiles only. Has he got enough tiles to do the job? Explain your reasoning. (3p)

9. A report contains the following chart and table that show how the height of a young tree changes. At the beginning the height of the tree is 1.00 m.



The time *t* in years	The height *h* of the tree in meters
0	1,00
1	1,20
2	1,44
3	1,73
4	2,07
5	2,49
6	2,99

a) How many per cent did the height of the tree change during the second year? (2p)

b) Examine how the height of the tree changes in different years and describe with words how it changes each year. (2p)

c) Construct a formula that can be used to calculate the height *h* of the tree in meters after a certain time of *t* years. 2p)

d) In what way should the formula be changed if the tree was 2.00 m from the beginning? (2p)

e) The formula in c) is a mathematical model of how the height of the tree changes.
What limitation/restriction does the model have? (2p)

10. A teacher said to his students:
Think of a number and add 15 to it. Multiply the sum by 4 and then subtract 8 from your result. Divide the difference by 4 and finally subtract 12 from your quotient. If you tell me what answer you came up with, I will tell you what number you were thinking of.

a) Monica comes up with 5 as her answer. What number was she thinking of? (2p)

b) Show that the teacher's method is correct for all numbers. (2p)