

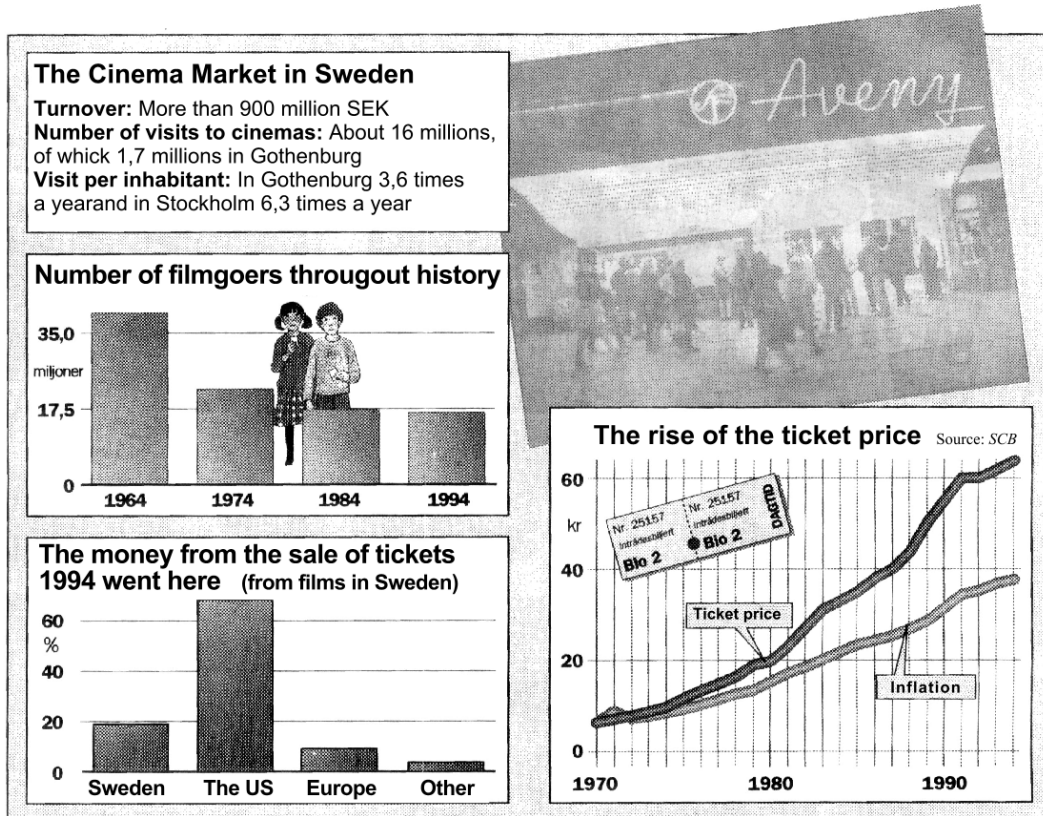
This material is confidential until the end of October 1998

Directions

Test period	May 8 – June 3 1998.
Test time	120 minutes without a break
Resources	Calculator and formula sheet. The formula sheet is attached to the test.
Test material	<p>The test material should be handed in with your solutions.</p> <p>Write your name, gymnasium programme/adult education and date of birth on the papers you hand in.</p>
The test	<p>The test is made up of 10 problems.</p> <p>Most of the problems are of the <i>long-answer type</i>, where a short answer is not sufficient, but it is required</p> <ul style="list-style-type: none">• that you write down what you do• that you explain your train of thought• that you draw figures when necessary. <p>Some of the problems (where it is stated <i>Only an answer is required</i>) need only an answer.</p> <p>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.</p>
The score levels	The teacher responsible will inform you about the scores required for "Passed" and "Passed with Distinction". The maximum score is 43 points.

1. a) Calculate $\frac{51}{3 \cdot 34}$ *Only an answer is required* (1p)
- b) Calculate $\frac{3^3}{5^2}$ *Only an answer is required* (1p)
2. A human heart pumps round on average about 5 litres of blood every minute. How many litres does that correspond to during a lifetime of 80 years? (2p)
3. Draw a triangle and a rectangle that each has an area of 24 cm². (2p)
4. a) Give three examples of numbers on the decimal form whose sum is 1. *Only an answer is required* (1p)
- b) Give two examples of fractions whose sum is 1. *Only an answer is required* (1p)
5. At Linda's birth, her grandmother deposits a certain amount of money on a bank account.
The expression $y = 2000 \cdot 1.0425^x$ describes the amount of money on the bank account x years later.
- a) How much money does Linda's grandmother deposit at Linda's birth? *Only an answer is required* (1p)
- b) The interest rate is the same all the time. How large is it? *Only an answer is required* (1p)
- c) How much money is there on Linda's bank account on her 8th birthday? (1p)
- d) How much money would there be on Linda's account on her 8th birthday, if the interest rate was changed to 3.5% after 5 years? (2p)

6.

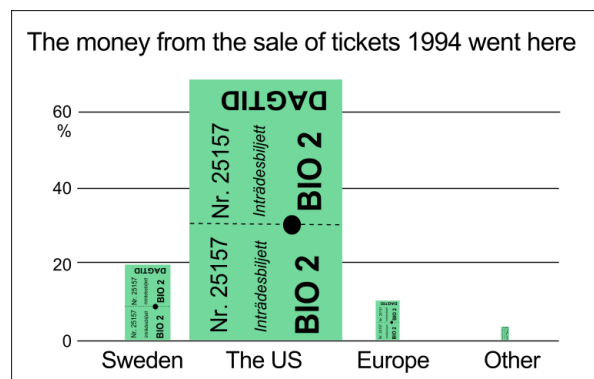


Picture: BENKT CHRISTIAN Graphics KATHARINA JOHANSSON
 Source: Göteborgs-posten

Use the diagrams above to answer the following questions:

- a) In what year was the price of a cinema ticket 40 SEK?
Only an answer is required (1p)
- b) During which three-year period did the ticket price in Sweden increase the most?
 Justify your answer. (2p)
- c) Totally, how much money did Swedish filmgoers pay for cinema tickets in 1984? (2p)

- d) A "nicer" way to draw one of the above bar charts would be like this.
 Why is this way misleading? (1p)



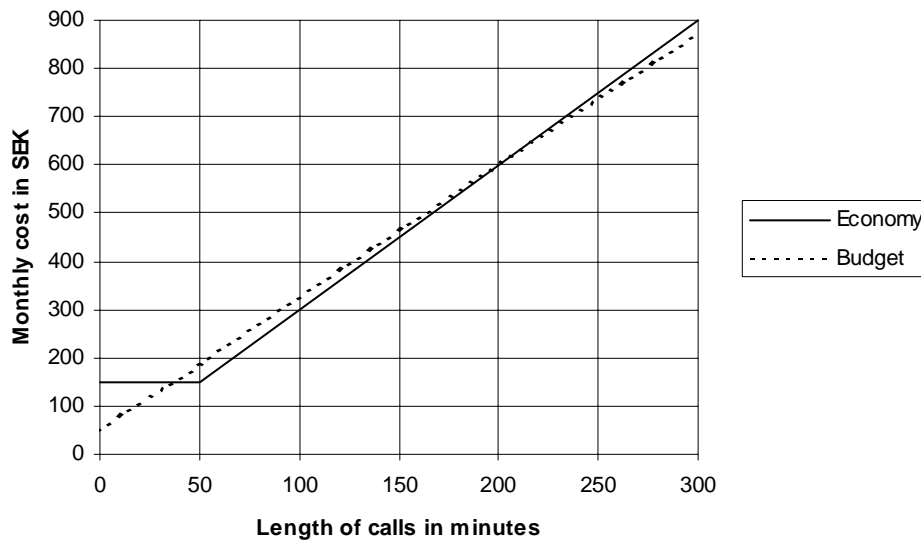
- e) Calculate the percentage change of the ticket price from 1980-1990 and compare with the inflation. (2p)

7. Sven is going to buy fruit and vegetables for 50 SEK from the counter on the picture. The equation $50 = 2 \cdot 14 + x \cdot 5$ arises when Sven has decided what to buy.

- a) Solve the equation $50 = 2 \cdot 14 + x \cdot 5$ (1p)
- b) Use the equation in a) and describe his purchases. (2p)
- c) Solve the equation $(1.00 - y) \cdot 16 = 10$ (2p)
- d) Which question about the fruit- and vegetable counter can be answered by solving the equation in c)? (1p)



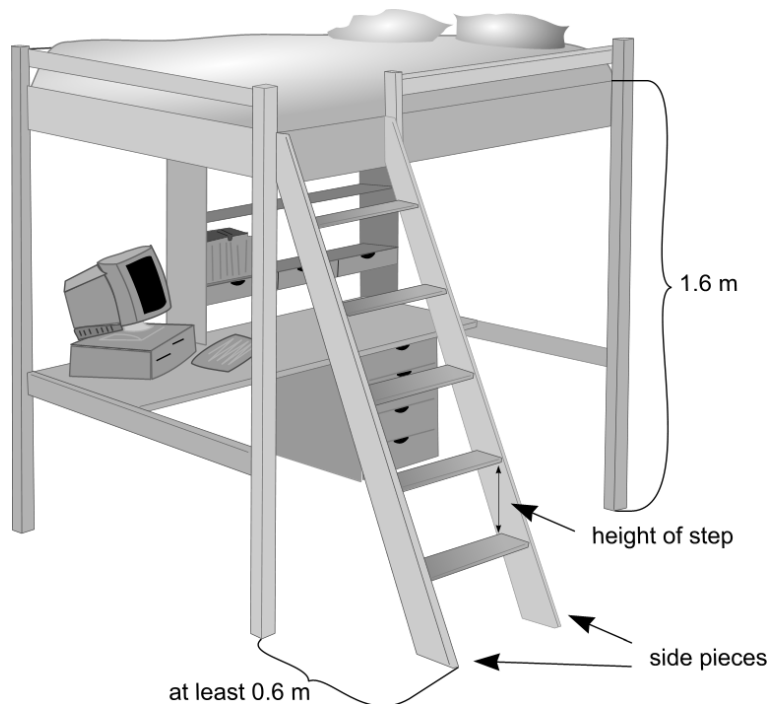
8. At a mobile phone company, young people can choose between two types of subscriptions, Economy and Budget. In the graph below you can see the monthly cost for different length of calls for the two types of subscriptions.



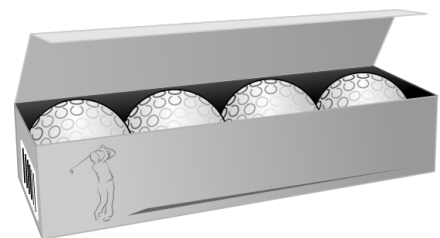
- a) How much does a holder of an Economy subscription have to pay one month when she has phoned 100 minutes? *Only an answer is required* (1p)
- b) Mats has an Economy subscription and Per has a Budget subscription. One month, their bills are equally large. Is it possible that they both can have phoned the same number of minutes? Justify your answer. (1p)
- c) Within what limits should your total length of call be if the Budget subscription is to be cheaper than the Economy subscription? (2p)
- d) Mia is going to buy a mobile phone, and she wants to know how much it will cost depending on the length of her calls. She phones you and asks you to describe the two types of subscriptions individually. Write down what you would say. (2p)

9. Moa and Martin are going to build stairs to the bed (see picture).
- They decide that the height of each step should be 20 cm.
How many steps do they need to saw? (1p)
 - The stairs must reach at least 0.6 m out on the floor. Decide how far you want their stairs to reach, and calculate the length of the planks they need for the side pieces. (2p)
 - To saw off the side pieces, they need to know the angle between the stairs and the floor.
Calculate this angle. (2p)

Note! To solve the problem, you cannot make any measurements in the figure.



10. a) The diameter of a golf ball must be 41.2 mm. Golf balls can be bought in boxes that hold exactly 4 golf balls. See figure to the right.



How much per cent of the volume of the box does the volume of the balls take up?

(2p)

- b) Tennis balls can be bought in cylindrical tubes that hold exactly 4 balls. See figure below.

Show that the relationship between the volume of the tube and the volume of the balls is $\frac{3}{2}$.

(3p)

