

Mathematics

Delprov D
Elevhäfte

1b

Elevens namn och klass/grupp

Instructions – Part D

Time for the test 120 minutes for Part D.

Aids Digital devices, formula sheet and ruler.

Tasks For most of the tasks in this part it is not enough to only give an answer, you also have to

- show your solutions
- explain/motivate your thinking
- draw figures when required.

For some tasks only the answer needs to be given. They are marked with “*Only answer required*”.

Grading limits The test (Part A–D) gives a total maximum of 89 points.

Limit for test grade

E: At least 21 points.

D: At least 35 points of which at least 11 points at level C or higher.

C: At least 46 points of which at least 20 points at level C or higher.

B: At least 58 points of which at least 6 points at level A.

A: At least 67 points of which at least 11 points at level A.

Name: _____

Date of birth: _____

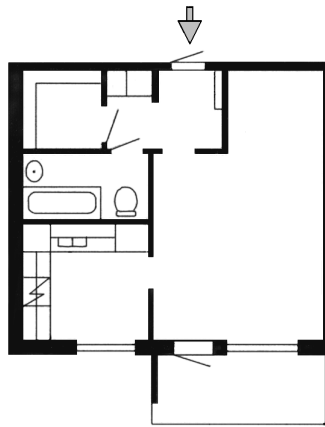
Secondary program: _____ Class: _____

Also write your name, date of birth, secondary program and class on the sheets you hand in.

Illustration: Jens Ahlbom

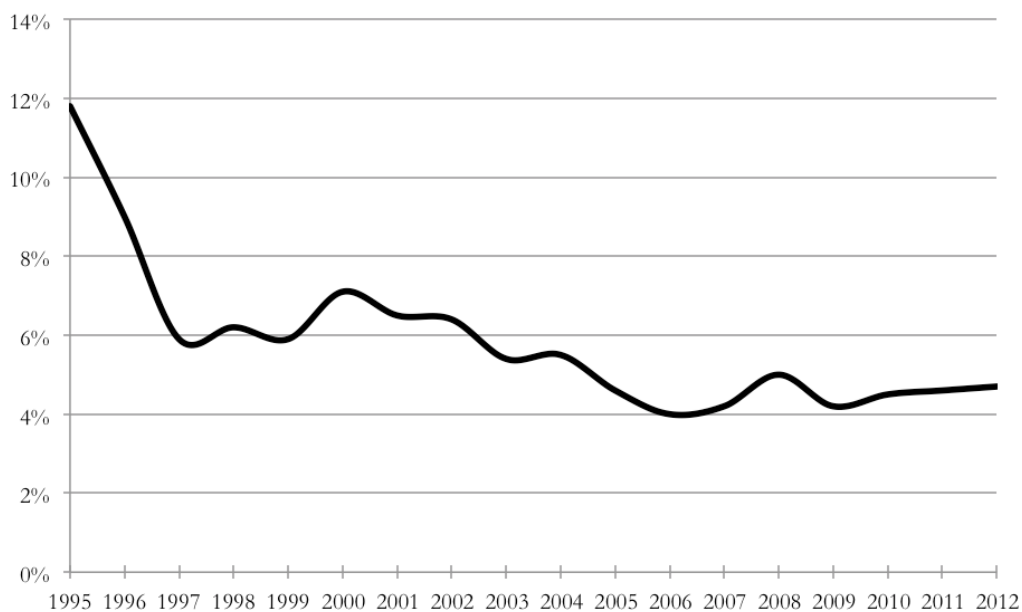
15. Louise has bought her first apartment. The apartment is 38 m² and she paid SEK 627 000 for it. How much did the apartment cost per square metre?

(1/0/0)



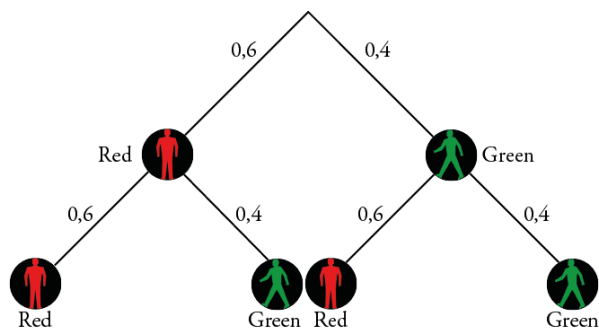
16. The diagram shows the interest rates of a bank from 1995 to 2012. At the bank, Kalle is told that the interest went down by 50 % between 1995 and 1997. Kalle looks at the diagram and does not think this sounds right; to him it looks like the interest has only gone down by 6 %. Explain to Kalle why he is wrong and the bank is right.

(2/0/0)



17. On her way to the centre, Alex crosses two zebra crossings. The tree diagram shows the probability of a red light and a green light. What is the probability that Alex will get a red light exactly once?

(1/1/0)



18. At a café, a cup of coffee was SEK 12 in 2007. What would the cost have been in 2012, if the price followed the CPI?

Year	CPI
2012	314.20
2011	311.43
2010	303.46
2009	299.66
2008	300.61
2007	290.51
2006	284.22

CPI = Consumer price index

(0/2/0)

19. Karin read in a paper about something called the Happy Planet Index, HPI. HPI claims to measure the extent to which countries provide conditions for sustainable development, while taking into consideration the well-being and life expectancy of the citizens.

HPI was calculated by using the formula
$$HPI = \frac{F \cdot U \cdot 0.642}{E + 3.35}$$
 where

F = Life expectancy in years

U = Well-being on a scale from 0–10

E = Ecological footprint in global hectares per person

Country (a selection)	Life expectancy (years)	Well-being (0–10)	Ecological footprint (g ha/person)	HPI
China	 72.5	 6.7	 2.1	57
India	 63.7	 5.5	 0.9	53
Germany	 79.1	 7.2	 4.2	48
USA	 77.9	 7.9	 9.4	31
Colour code  Good  Average  Poor				

Source: Happyplanetindex.org

- a) According to the article, Costa Rica has the highest HPI in the world. The life expectancy in Costa Rica is 78.5 years. Calculate the HPI of Costa Rica, when the value for well-being is 8.5 and the ecological footprint is 2.3. (2/0/0)
- b) Sweden has an HPI of 48. Life expectancy is 80.5 years. Our ecological footprint is 5.1. Which value do we have for well-being in Sweden? (1/1/0)
- c) Despite the fact that Germany has a lower life expectancy and a lower value for well-being, they have the same HPI as Sweden. Explain how the value for the ecological footprint affects the value of the HPI. (1/1/0)

20. On November 30 2011, the population on earth reached 7 billion people. The diagram shows the change in the number of people on earth at a given period in time.

a) Using the diagram, estimate how big a part of the population was living in Asia in 2011.

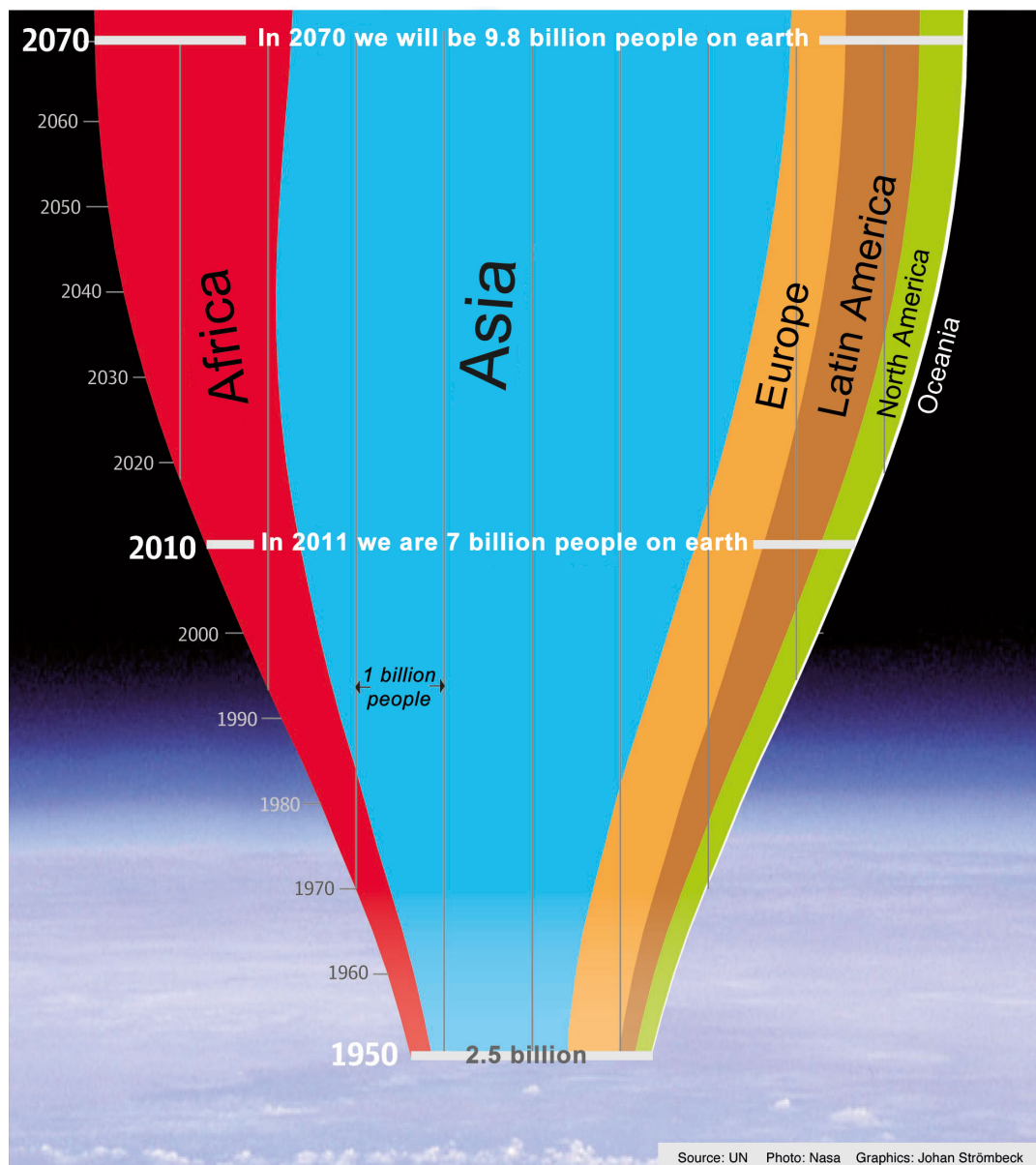
(2/0/0)

b) By how many per cent did the population on earth increase between 1950 and 2011?

(1/1/0)

c) Determine the relationship between the estimated percentage change in the population between 2010 and 2070 and the percentage change in the population between 1950 and 2010. What does this tell you about the change in population?

(0/2/1)



21.

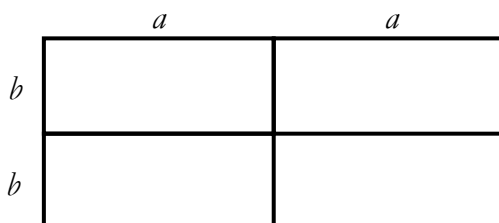
Borrow SEK 2 000 pay SEK 2 455 after 1 month.

- a) Which interest rate, in per cent, is paid on the loan?
Only answer required. (1/0/0)
- b) If the loan is not paid back on time, the debt after the first month will amount to SEK 2 455. After yet another month you must pay interest on this amount, at the same percentage rate as for the first month.
How much will you owe after two months? (1/0/0)
- c) If the debt is not repaid, it will keep growing in the same way.
How much will you owe one year after borrowing SEK 2 000? (1/1/1)
- d) How much will the annual interest (annual percentage rate) be on the loan? (0/1/1)

22. Two six-sided dice are thrown. If the product of the number of dots on both dice is an even number, how great is the probability then that the sum of the dots on both dice is also an even number? (1/1/2)



23. The figure shows a field consisting of three rectangles.
Both a and b are *positive integers* and they indicate the length of the sides.



- a) Write an expression for the perimeter of the entire field.
Only answer required. (1/0/0)
- b) Investigate the area of the entire field, if its perimeter is 28 metres. (0/2/3)

