

Kursprov, höstterminen 2014

Mathematics

Delprov D

1b

Elevens namn och klass/grupp

Instructions – Part D

Time for the test 120 minutes for Part D.

Aids Allowed aids on part D are digital devices, formula sheet and ruler.

Tasks This part consists of several tasks. The solutions are to be written on separate paper, which is to be submitted together with the test booklet. 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 36 points of which at least 13 points at level C or higher.

C: At least 47 points of which at least 22 points at level C or higher.

B: At least 59 points of which at least 7 points at level A.

A: At least 68 points of which at least 12 points at level A.

Name: _____

Date of birth: _____

Program: _____ Class: _____

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

Illustration: Jens Ahlbom

16. Göran has taken out an interest-only mortgage of SEK 800 000. How much does he pay in interest per month if the annual interest rate is 3.6 %?

(2/0/0)

17. For a car with good tyres and brakes the approximate braking distance on dry asphalt is calculated using the formula:

$$s = \frac{v^2}{200}$$

where s is the braking distance in metres and v is the speed in km/h.

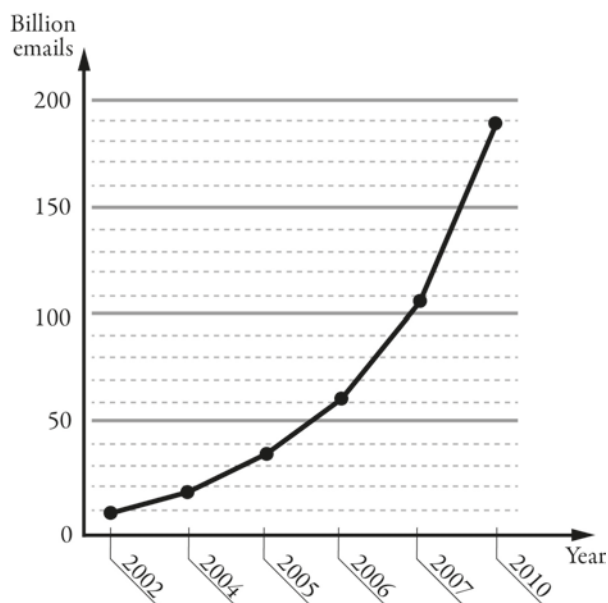
How much longer is the braking distance according to the formula if you drive at a speed of 70 km/h compared with if you drive at 50 km/h?

(2/1/0)



18. The diagram shows the number of billion emails sent on average in the world every day.

- a) Out of all the emails sent, it is estimated that about 82 per cent are spam (unwanted email). About how many spam were sent in a day in 2010? (2/0/0)
- b) The diagram is misleading. What is misleading in the diagram? (1/1/0)
- c) If the diagram was drawn correctly, how would this affect the appearance of the diagram? (1/1/0)



19. On a packet of seeds it says that the germination rate is 80 %. This means that on average 8 out of 10 seeds will sprout.



- a) How many seeds will likely sprout if you sow 25 seeds? (1/0/0)
- b) What is the probability that both seeds will sprout if you sow two seeds? (0/1/0)
- c) What is the probability that just one seed will sprout if you sow two seeds? (0/2/0)

20. The table shows estimated population change on Earth, 2010.

	Births	Deaths	Increase
Year	131 940 516	56 545 138	75 395 378
Month	10 995 043	4 712 095	6 282 948
Day	361 481	154 918	206 563
Minute	251	108	143
Second	4.2	1.8	2.4

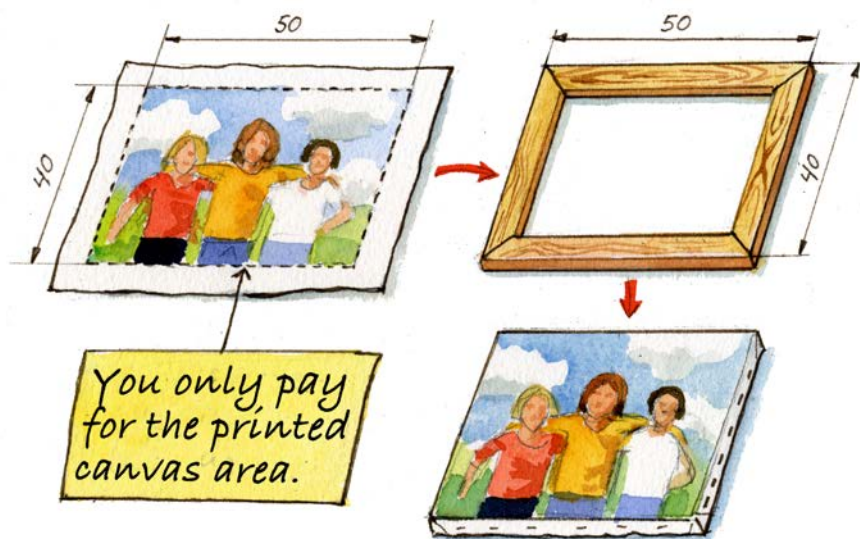
Source: U.S. Census Bureau

- a) Around 9 million people live in Sweden. Using the table, calculate the approximate time it would take for the Earth's population to increase by 9 million. (2/0/0)
- b) Pelle states: "For every breath I take, one new person is born on average." Can Pelle be right? Motivate your answer. (0/1/0)
21. The corners of a triangle have the coordinates $(1,2)$, $(3,4)$ and $(2,5)$. Reflect the triangle in the line $y = x + 1$ and state the coordinates of the reflected triangle's corners. (1/2/0)

22. Kasper buys shares in a fund for SEK 12 000. He calculates that the shares' value will increase by 12.5 % per year. In that case, how much will the shares be worth after 10 years? (0/2/1)

23. In the equality $\frac{15}{c} = \frac{d}{4}$ c and d are positive integers.
- a) Give *one* suggestion for what values c and d might have so that the equality holds. *Only answer required.* (1/0/0)
- b) Investigate what values c and d can have so that equality will hold. (1/1/1)

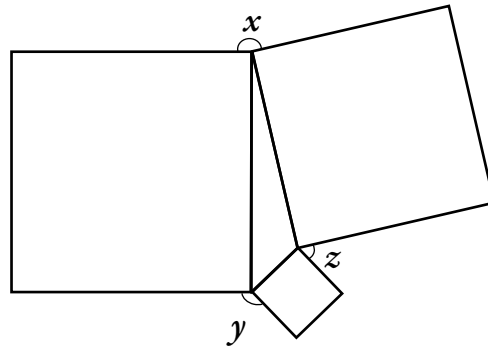
24. A photographic dealer's prints rectangular pictures on canvas and then mounts the picture on a wooden frame. The wooden frame costs SEK 0.45/cm. Canvas with print costs SEK 0.12/cm². The cost of mounting is SEK 169 for all frame sizes.



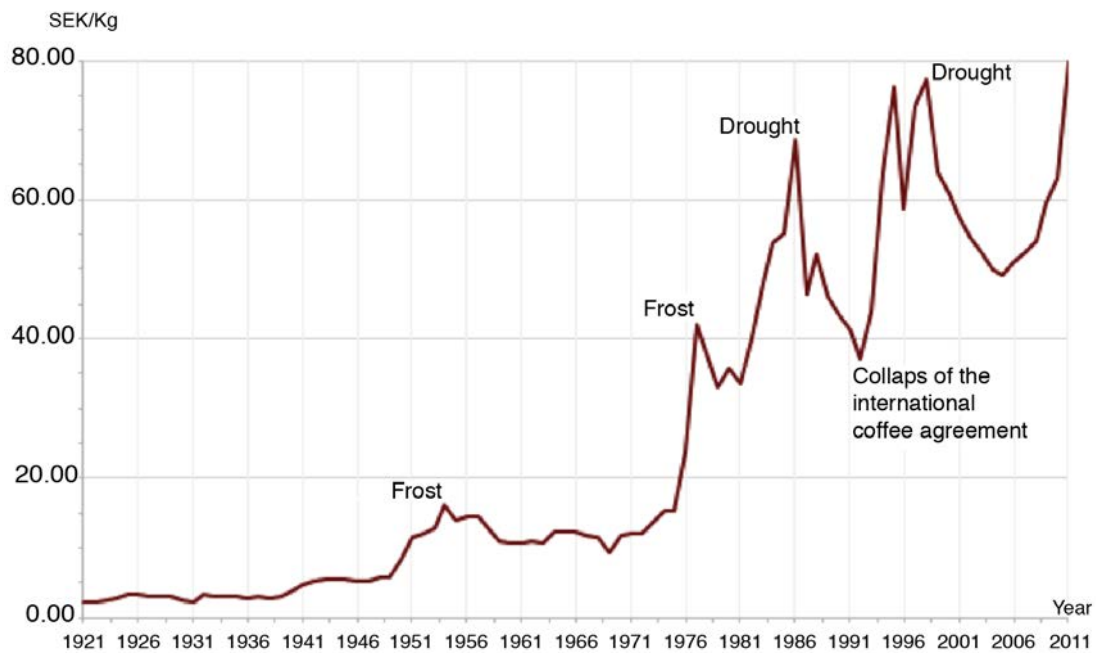
- a) Yasmin wants to print a picture and have it mounted. She wants the picture 50 cm high and 40 cm wide. What will be the cost? (1/2/0)
- b) To calculate the price of mounted pictures, the staff needs a formula which includes height and width. The price has to include the canvas with printing, frame and cost of mounting. Help the photographic dealer's to create such a formula. (0/2/2)

25. In a triangle, squares are drawn based on the triangle's sides, see figure. Show that $x + y + z = 360^\circ$.

(0/2/2)



26. The graph shows the price development for one kilogramme of coffee in Sweden. According to an index series, the index for the coffee price was 330 in the year 2011. What year was the index series' base year?



(0/0/2)

