

Mathematics

Delprov D

1a

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 one task only the answer needs to be given. It is marked with “*Only answer required*”.

Grading limits The test (Part A–D) gives a total maximum of 75 points.

Limit for test grade

E: At least 19 points.

D: At least 33 points of which at least 12 points at level C or higher.

C: At least 41 points of which at least 18 points at level C or higher.

B: At least 53 points of which at least 6 points at level A.

A: At least 60 points of which at least 9 points at level A.

Name: _____

Date of birth: _____

Programme: _____ Class: _____

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

Illustrations: Jens Ahlbom

17. Calculate $\frac{5050}{305 - 52.5}$ *Only answer required.* (1/0/0)

18. A bank loan of SEK 60 000 is to be repaid in equal instalments every month for 10 years. How much is the monthly instalment? (1/0/0)

19. In 1950 the world's population was 2.5 billion. A forecast was made to help predict the size of the world's population in the future. The forecast resulted in the formula:

$$y = 2.5 \times 1.017^x$$

where y is the world's population in billions and x the number of years after 1950.

What is the size of the world's population this year according to the formula?



(2/0/0)

20. A 125-ml tube of toothpaste contains 1450 ppm of fluoride. How many millilitres (ml) of fluoride does the toothpaste tube contain? (2/0/0)



21. The table below shows the Consumer Price Index (CPI) for three different years. It also lists the price of a pair of jeans in the same years.

Year	2000	2005	2010
Consumer price index (KPI)	260.7	280.4	303.5
Price of jeans (SEK)	700	750	900



Investigate whether the price trend of the jeans conforms to the CPI for the years in the table.

(1/1/0)

22. The table shows estimated population change in the world, 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 lived in Sweden at that time. Using the table, calculate the approximate time it would take for the world’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)

23. The figures below form a pattern created by isosceles triangles. The sides of each triangle measure 2 cm, 2 cm and 3 cm.



The figures are not drawn to scale.

- a) What is the perimeter of figure 5? (1/0/0)
- b) What is the number of the figure with a perimeter of 1 m? (0/2/0)

24. In 2013, 3% of all trips on public transport services in Stockholm were made by “fare-dodgers”, i.e. trips made without paying. This is equivalent to one million dodged fares per month. How many trips in total were made on public transport services in Stockholm in the whole of 2013? (0/2/0)

25. A jersey cost SEK 800. When a shop had a sale, the prices were reduced in two rounds, first by 20 % and then to half the sale price. Anna and Emelie calculate the price of the jersey after both price changes.



Anna calculates the price like this:

$$800 \times 0.8 \times 0.5 = 320$$

The sale price is SEK 320.

Emelie calculates the price like this:

$$800 - 800 \times 0.2 - 800 \times 0.5 =$$

$$= 240$$

Answer: The price is SEK 240.

Who has calculated the price correctly and how could Anna and Emelie have been thinking?

(1/1/1)

26. Simon has a part-time job in a grocery store. He wants to come up with a method for calculating the number of shopping baskets in a stack by measuring the height of the stack. He knows that each shopping basket has a height of 28 cm and that two stacked shopping baskets have a height of 32 cm.

a) How tall is a stack of five shopping baskets?

(2/0/0)

b) Write a formula for the relation between the number of shopping baskets and the height of the stack.

(0/2/1)



27. Yasmine is playing a go-kart video game. The game has mushrooms that you can hit to help drive faster.



A green mushroom that increases your speed by 10 %



A red mushroom that increases your speed by 20 %



A yellow mushroom that increases your speed by 10 km/h

- a) Yasmine needs to hit one mushroom of every colour.

In what order does she need to hit the mushrooms to increase her speed as much as possible?

Motivate your answer.

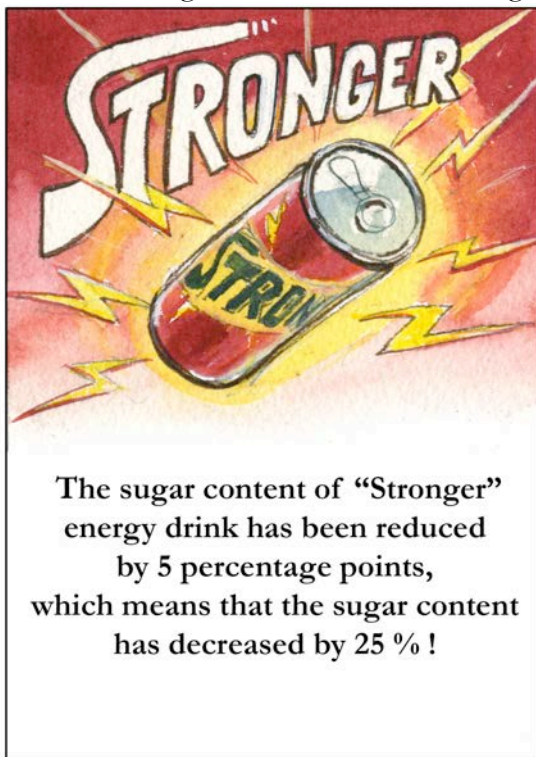
(0/2/1)

- b) Yasmine hits the mushrooms in the order you have given in a) and doubles her speed as a result.

What was her speed before she hit the mushrooms?

(0/1/1)

28. An advertising leaflet has the following statement:



The sugar content of “Stronger” energy drink has been reduced by 5 percentage points, which means that the sugar content has decreased by 25 % !

What percentage of sugar does the energy drink contain after the reduction?

(0/1/1)

