Mathematics

Delprov D

1c

Elevens namn och klass/grupp

Prov som återanvänds av Skolverket omfattas av sekretess
enligt **17 kap. 4 § offentlighets- och sekretesslagen.**
Detta prov återanvänds av Skolverket t.o.m. **2023-06-30.**

Skolverket

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 92 points.

Limit for test grade

E: At least 17 points.
D: At least 32 points of which at least 13 points at level C or higher.
C: At least 43 points of which at least 22 points at level C or higher.
B: At least 57 points of which at least 8 points at level A.
A: At least 68 points of which at least 15 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

18. Suppose that the time is 9 o'clock in the morning.
What will the time be 1 000 hours later? (2/0/0)

19. Kalle's class is collecting money to the class fund and wants to organise a school disco. They have found a place that costs SEK 500 to rent and a DJ with a sound system that costs SEK 1 500. They are going to sell tickets for SEK 50 per ticket.

a) How big a profit will the class make if they manage to sell 100 tickets? (1/0/0)

b) State a function $V(x)$ that shows the class' profit/loss after x number of sold tickets. (1/1/0)

c) There will be a maximum of 200 paying guests at the disco.
Determine the range of the function. (1/1/1)

20. You roll two dice. One die has four sides, numbered 1 to 4. The other die has six sides, numbered 1 to 6. Show that the probability of at least one of the dice showing a "three" is 3/8.

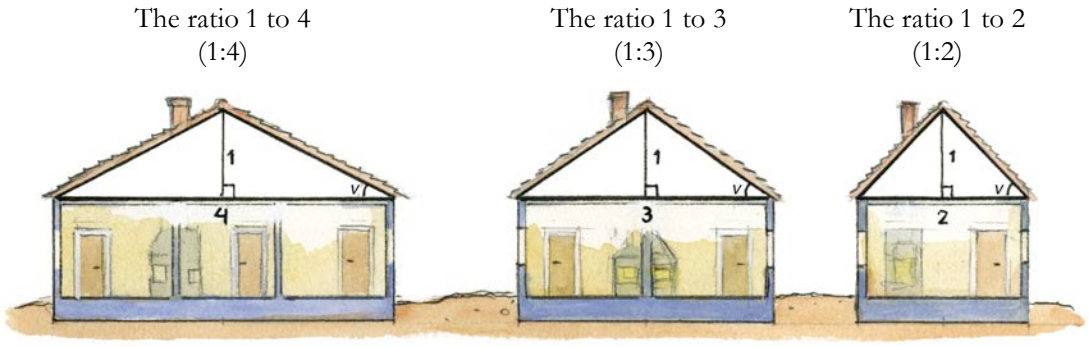
(1/2/0)

21. In 2014, the price of electricity was 27 öre per kWh. That was 40 % lower than the year before. How much did 1 kWh cost in 2013?

1 kWh = 1 kilowatt hour

(0/2/0)

22. In the old days, the slope of a roof was indicated as a ratio between two distances, see figure.



Source: ICA bokförlaget, Så renoveras torp och gårdar

Nowadays, the roof's slope is indicated with the roof pitch, which is the angle v between the roof and the horizontal plane expressed in degrees, see figure.

a) What is the roof pitch which corresponds to the ratio of 1 to 3? (2/0/0)

b) Will the roof pitch be doubled if the ratio of 1 to 3 is changed to the ratio of 1 to 1.5? Motivate. (0/2/0)

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. Kim and Alex are comparing results from the school election. Kim says that an increase from 16 % to 19 % is greater than an increase from 32 % to 36 %. Alex says that it is the other way around. Can they both be right? Motivate. (1/1/1)

25. Emre is going to take out a new mobile phone subscription. His grandmother lives in Turkey and in an average month Emre makes 3 hours of domestic calls and 2 hours of international calls.

a) Which of the following subscriptions is the cheapest for him? (1/1/0)

	Subscription A	**Subscription B**
Fixed monthly rate	SEK 100	SEK 289
Call rate, domestic	SEK 0.49/min	SEK 0.49/min
Call rate, international	SEK 4.69/min	SEK 0.49/min

b) Write one formula for Subscription A and one for Subscription B, in which T is the total cost per month, d is the number of minutes of domestic calls, and i is the number of minutes of international calls. (0/2/0)

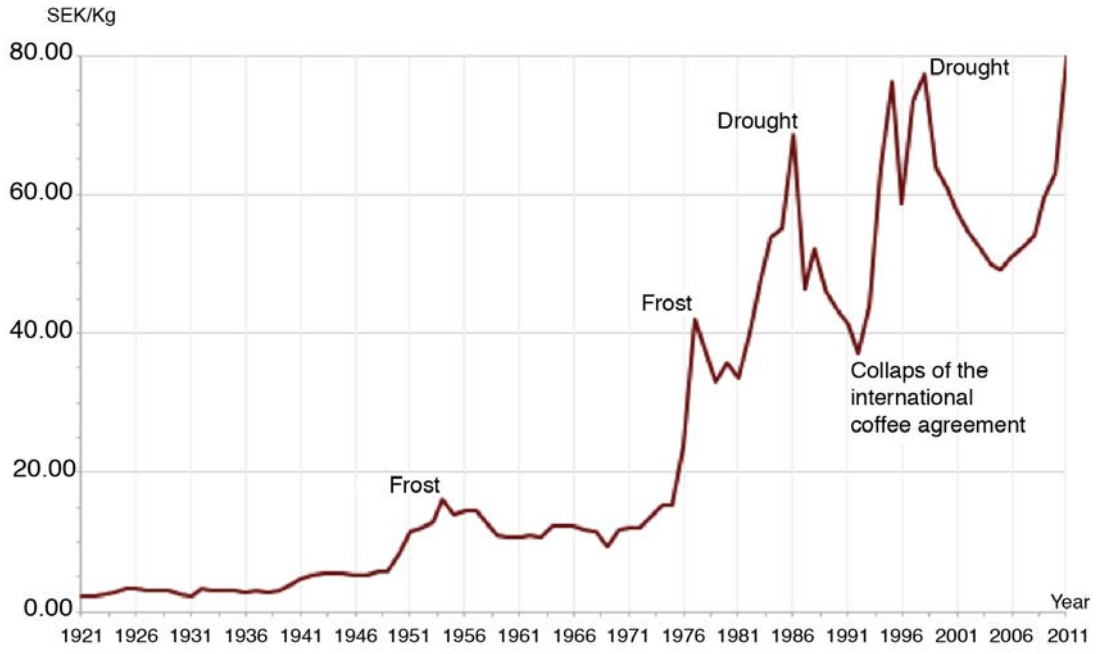
c) For which call durations (domestic and international) do the two subscriptions cost the same? (0/1/2)

26. Frida takes out an SMS loan of SEK 1 000. The loan is to be repaid after one month and the monthly interest rate is 20 %. At the end of the month Frida cannot afford to pay her debt.

In order to pay her debt she takes out a new SMS loan for the whole amount she owes. The new loan has the same monthly interest rate.

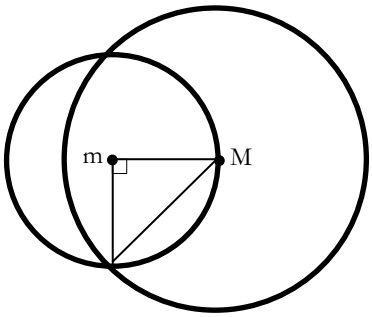
Frida continues to borrow in the same way every month.
How large is Frida's debt one year after she took out her first SMS loan? (0/2/1)

27. 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)

28. Show that the area of the large circle is twice as large as the area of the small circle. M is the centre point of the large circle, and m is the centre point of the small circle. (0/2/2)



© Skolverket

PRIM gruppen