Mathematics

Delprov D

1b

_____

Elevens namn och klass/grupp

Skolverket

Instructions – Part D

Name: _____

Date of birth: _____

Programme:_____ Class: _____

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

Illustration: Jens Ahlbom

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

18. 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 to driving at a speed of 50 km/h? (2/1/0)

19. Kalle's class is collecting money for 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 much profit will the class make if they manage to sell 100 tickets? (1/0/0)

b) Specify 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. A share has an original value of SEK 200. In the first week
the value increases by 10 % and in the second week it decreases by 10 %.
The value of the share continues to change in accordance with the same pattern.

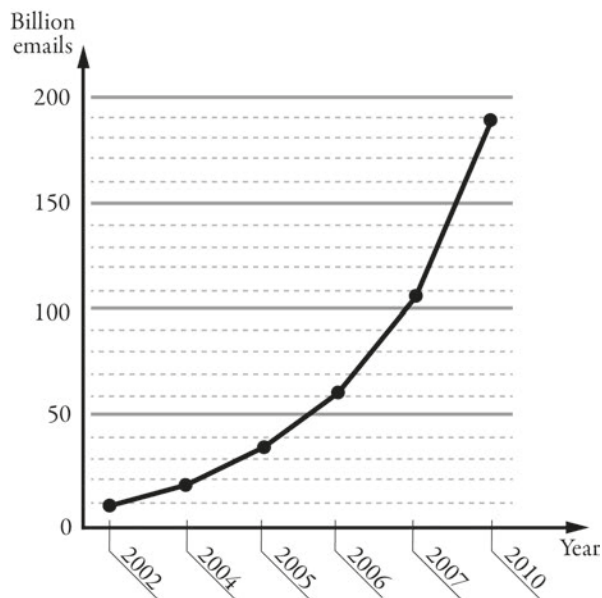   a) What is the share worth after two weeks?   (2/0/0)

    b) What is the share worth after 100 weeks?   (0/1/1)

21. 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 emails). 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)

22. In 1750, the world's population was 750 million.
In 1870, the world's population was twice as large.
By how many per cent did the population increase on average per year?   (0/2/0)

23. The table below shows the average price of lunch in 2006 and 2012 in a couple of cities in Sweden. Has the lunch price in Malmö increased more or less than the CPI (Consumer Price Index)? (0/2/0)

Lunch price in SEK

Year	Stockholm	Göteborg	Malmö	National average
2012	81.3	77.2	76.4	79.1
2006	68.1	67.4	66.8	67.5

Source: Gastrogate

Year	CPI
2012	314
2011	311
2010	303
2009	300
2008	300
2007	290
2006	284

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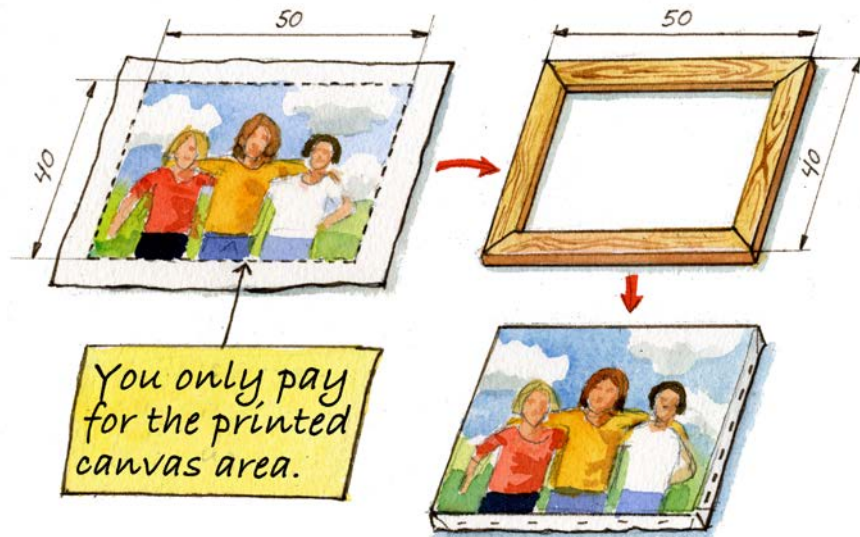
In order to pay her debt she takes out a new SMS loan for the whole amount she owes. The new loan has the same monthly interest rate.

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)

26. 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.

You only pay for the printed canvas area.

a) Yasmin wants to print a picture and have it mounted. She wants the picture to be 50 cm long and 40 cm wide. What will the cost be? (1/2/0)

b) To calculate the price of mounted pictures, the staff needs a formula which includes length 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)

27. 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)

PRIM
gruppen