

# Mathematics

Delprov D

Årskurs

9

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Elevens namn och klass/grupp

## Instructions – Part D

Complete solutions are required for most of the tasks.

A complete solution means that you have shown your work clearly enough for another person to read and understand it. It is important that you show all of your work. You can get points for a partly solved task.

No points are given for the correct answer on its own, other than in the tasks marked *Only the answer is required*.

The maximum number of points you can get for your solution is shown after each task. For example, (2/1/0) means that the task can give 2 E-points, 1 C-point and 0 A-points.

Aids: Calculator and formula sheet.

Time for the part: 100 minutes.

*Solutions and answers must be written on a separate sheet of paper, not in the test booklet. The test booklet is to be handed in along with your solutions.*

Name: \_\_\_\_\_

School: \_\_\_\_\_ Class: \_\_\_\_\_

Date of birth (year/month/day): \_\_\_\_\_

Good luck!

Illustrations: Jens Ahlbom



**When assessing your work, the teacher will consider**

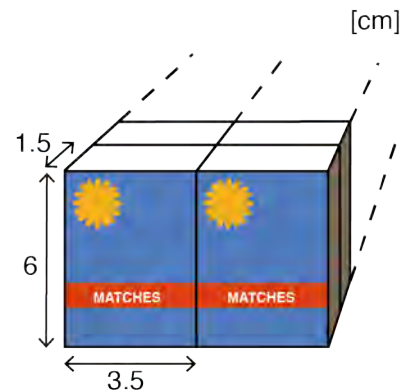
- what mathematical knowledge you have shown
- how well you have shown your reasoning
- how well you have shown your work.

18. Bea is training for a marathon. She goes for a run along a trail in the forest that is 5.3 km long. A marathon is roughly 4.2 Swedish “mil” long. How many *full* laps must she run on the trail in order to run at least as far as a marathon?



(2/0/0)

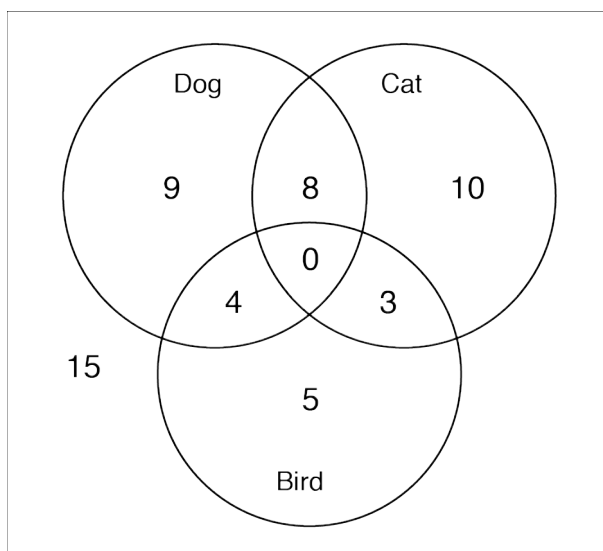
19. A matchbox has the measurements 6.0 cm, 3.5 cm and 1.5 cm. Several matchboxes are put together in a package with the volume  $315 \text{ cm}^3$ . How many matchboxes are in the package?



(2/0/0)

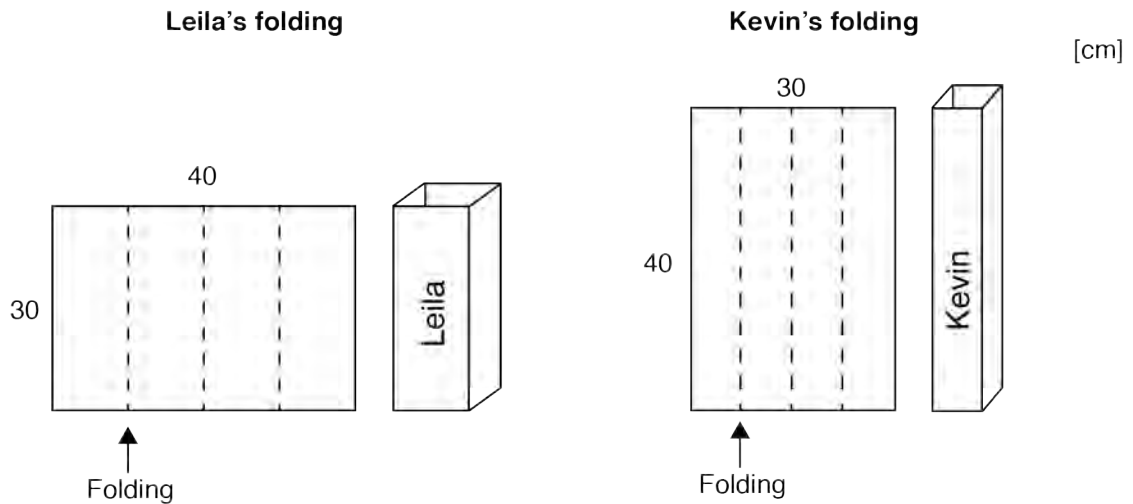
20. There are 972 pupils at Östra skolan. Noa wants to find out how many of the pupils have a pet, and carries out a random survey in which he asks 54 pupils. He compiles his result in a diagram. The diagram shows that 9 pupils have only a dog, and 8 pupils have both a dog and a cat.

Use the result of Noa’s survey to estimate how many pupils in the *whole* school have a dog.



(2/1/0)

21. Leila and Kevin are each building a prototype (model) for a “popcorn container” for the class party. They use the same type of paper, but fold it differently. After folding, they attach a bottom made from another sheet of paper.



Leila and Kevin are using sheets of paper measuring 30 cm x 40 cm. Which one of them folds their paper in a way that creates the greatest volume? Write down your calculations to show that your answer is correct.

(1/2/0)



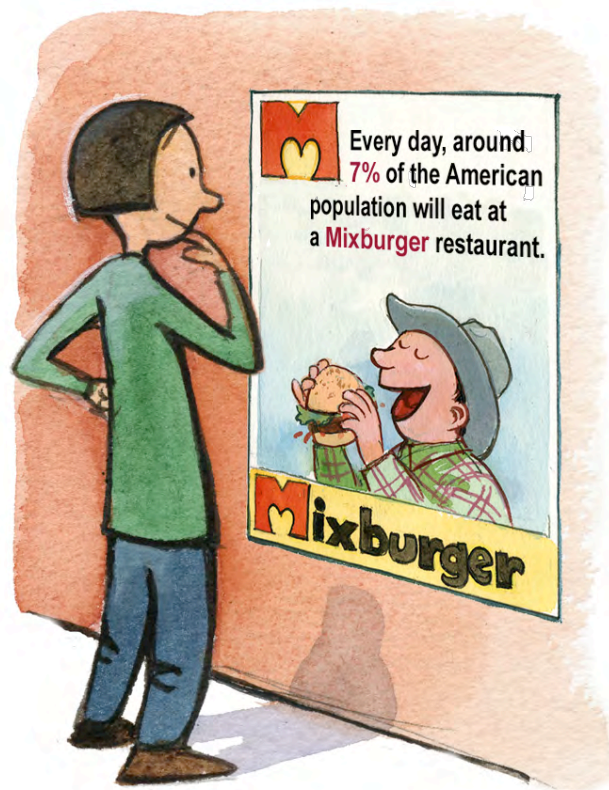
22. Bea and Leila have been given a box of salami sausages to sell, so that they can earn some money for a class trip. When Bea has sold  $\frac{1}{3}$  of all the sausages and Leila has sold  $\frac{1}{4}$  of all the sausages, 15 salami sausages remain. How many salami sausages were there in the box to start with?

(1/2/0)



23. In the USA, there are around 8 000 Mixburger restaurants. Each restaurant has around 2 500 customers per day. The population of the USA is roughly  $3 \times 10^8$ . Is this advert true? Show your calculations and reasoning.

(1/2/0)



24. Oscar asks his classmates which sport they like best. They can choose from five alternatives. The table shows Oscar's compiled data.

Sport	Tally	Frequency
Floorball		5
Ice-hockey		3
Equestrian sports		1
Gymnastics		1
Football		11

- a) How many pupils did Oscar ask? *Only the answer is required.* (1/0/0)
- b) What is the mode of Oscar's survey? *Only the answer is required.* (1/0/0)
- c) A few of the pupils look at Oscar's survey and wonder what the median is. Which pupil is right? Motivate your answer.

The diagram shows four pupils with speech bubbles:

- Noa: "Ice-hockey is the median."
- Leila: "3 is the median."
- Kevin: "Equestrian sports is the median."
- Bea: "It is not possible to determine the median."

(0/1/1)

25. In 2004, a new social media was introduced. The table shows the number of users in different years.

Year	Number of users (millions)
2006	15
2008	110
2010	400
2012	901
2014	1 055



Kevin and Noa are thinking about how much the use of this social media has increased. Kevin says that the increase was greatest between 2010 and 2012, while Noa is of the opinion that the increase was greatest between 2006 and 2008. Explain using calculations and reasoning why Kevin and Noa both are right. (1/1/1)

26. The proportions of the Swedish flag are 5:2:9 lengthwise and 4:2:4 in width. The yellow cross is equally wide in all parts of the flag (see figure).



- a) Leila's boat has a Swedish flag in the back. The ribbon that forms the yellow cross is 12 cm wide. What is the length and width of Leila's flag? (1/1/0)
- b) An unusually large Swedish flag has an area of 90 m<sup>2</sup>. What is the length and width of this flag? (0/2/2)





27. Class 9 B is organising a summer party to raise money for a children's home. Over the last few years, the class has organised similar parties.

Last year's party-goers paid a total of SEK 8 380.

Adults paid SEK 120 and children SEK 50 to go to the party.

Bea wants to know how many adults and children had been at the party, so Noa helps her to set up the following equation:

$$50 \cdot x + 120 \cdot (92 - x) = 8\,380$$

- a) What does  $x$  stand for? *Only the answer is required.* (1/0/0)
- b) Help Bea solve the equation. Show your calculations. (0/2/1)
- c) How many adults and how many children came to the party? (0/2/1)



28. Below you see four equations. Investigate whether the equations A–D have *no* solution, *one* solution or *two* solutions. Show your work and draw conclusions.

A:  $3x + 2 = 3 + 2x$

B:  $2x + 2 = 3x + 2$

C:  $2x + 2 = 3 + 2x$

D:  $x^2 - 1 = 3$



(0/2/2)





