Part D	Problems 16–22 which require complete solutions.
Test time	120 minutes.
Resources	Digital resources, formula sheet and ruler.

The test consists of three written parts (Part B, Part C and Part D).
Together they give a total of 53 points consisting of 22 E-, 18 C- and 13 A-points.

Level requirements for test grades
E: 14 points
D: 22 points of which 6 points on at least C-level
C: 28 points of which 10 points on at least C-level
B: 36 points of which 4 points on A-level
A: 42 points of which 7 points on A-level

The number of points you can get for a complete solution is stated after each problem. You can also see what knowledge levels (E, C and A) you can show in each problem. For example (3/2/1) means that a correct solution gives 3 E-, 2 C- and 1 A-point.

For problems labelled "*Only answer is required*" you only have to give a short answer. For other problems you are required to present your solutions, explain and justify your train of thought and, where necessary, draw figures and show how you use your digital resources.

Write your name, date of birth and educational programme on all the sheets you hand in.

Name: _____

Date of birth: _____

Educational programme: _____

Part D: Digital resources are allowed. Write down your solutions on separate sheets of paper.

16. Determine the equation of two different straight lines that intersect at the point (1, 4). (2/0/0)

17. Sandor is going to start a business where he will make and sell macarons.

He assumes that he will be able to sell all the macarons he makes for SEK 5 each. When selling x macarons, Sandor makes SEK P.

a) Write down the relation for P as a function of x.
Only answer is required (1/0/0)

When Sandor starts his business he has to buy baking equipment at a cost of SEK 510. The ingredients for each macaron cost SEK 1.50. The function $K(x) = 1.5x + 510$ describes the total manufacturing cost when manufacturing x macarons.

b) Determine the minimum numbers of macarons Sandor has to sell in order to make a profit. (2/0/0)

18. Siiri, Ellen and Mirja are friends. Case A and case B concerns the three friends. The left statement is true for case A and case B.

Case A	Mirja is the oldest.	$\Longrightarrow$	Siiri is younger than Mirja.
Case B	Siiri has no driving license.	$\Longrightarrow$	Mirja and Ellen each has a driving license.

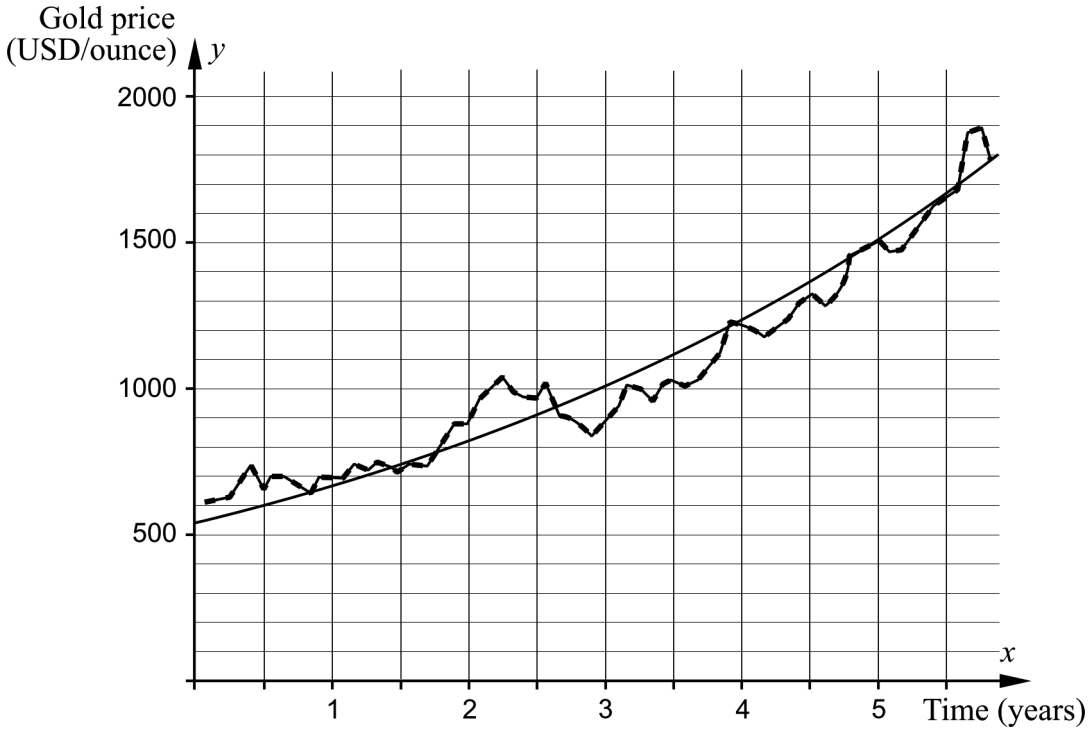
Write down for both case A and for case B whether the implication $\Rightarrow$ between the cases is true.

Justify your answer for both case A and case B. (2/0/0)

19. Albin starts the new year by swimming once a week. Each week he increases the distance by 50 m. In week 19 he swam three times as far as he did in week 1.

Determine how far Albin swam in week 19. (0/2/0)

20. The diagram shows the price trends of gold and the graph of an exponential function that has been adjusted to the values. The x-axis shows the time in years after January 1, 2006 and the y-axis shows the gold price in USD/ounce.



Determine the adjusted exponential function. (0/2/0)

21. Sanna makes bracelets from reindeer leather, tin thread and silver beads. She makes two different kinds of bracelets, see table.

Type of bracelet	Material consumption	Total material cost
 Bracelet with four strand braid	550 cm tin thread 25 cm reindeer leather	SEK 110.50
 Double bracelet with single braid and silver beads	350 cm tin thread 50 cm reindeer leather 20 silver beads	SEK 146

The silver beads cost SEK 3/piece. Calculate the cost in SEK/m for the tin thread and the cost in SEK/m for the reindeer leather. (0/3/0)

22. When replacing windows in an old brick building, wooden heads are needed above the rectangular windows. The upper edge of the heads have the same shape as the graph of a quadratic function, see figure 1.

The width of a head is 120 cm and the largest height is 30 cm, see figure 2.

Figure 1

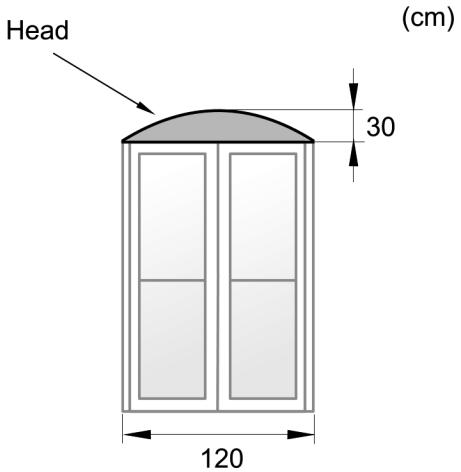


Figure 2

The woodworks which will make the wooden heads want to determine a quadratic function in order to make a model of the head.

Determine a quadratic function that describes the upper edge of the head. (0/0/3)