





## Instructions – Part B

**Time for the test** 60 minutes for Part B.

**Aids** Allowed aids on Part B are formula sheet and ruler.

**Tasks** This part consists of tasks to be solved without using digital devices. Answers and solutions are to be written in the test booklet. Some of the tasks require working, which is to be shown in the box next to the task. For the other tasks only the answer is required. The maximum number of points that you can get for your answer/solution is shown after each task.

**Grading limits** The test (Part A–D) gives a total maximum of 83 points.

Limit for test grade

E: At least 19 points.

D: At least 34 points of which at least 13 points at level C or higher.

C: At least 41 points of which at least 19 points at level C or higher.

B: At least 53 points of which at least 7 points at level A.

A: At least 64 points of which at least 13 points at level A.

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

Date of birth: \_\_\_\_\_

Programme: \_\_\_\_\_ Class: \_\_\_\_\_

Illustration: Jens Ahlbom



1. Determine the value of  $4x + 3$  if  $x = 3$ . Answer: \_\_\_\_\_ (1/0/0)

2. What value of  $x$  does *not* satisfy the condition  $2x + 1 > 5$ ?  
Circle your answer.

7            5            4            3            2 (2/0/0)

3. The following relations are either equivalences or implications.  
Mark equivalence with a  $\Leftrightarrow$  and implication with a correct implication  $\Rightarrow$  or  $\Leftarrow$ .

Pernilla lives in Sweden.  Pernilla lives in Europe.

The quadrangle F is a rectangle.  The quadrangle F is a square.

(1/0/0)

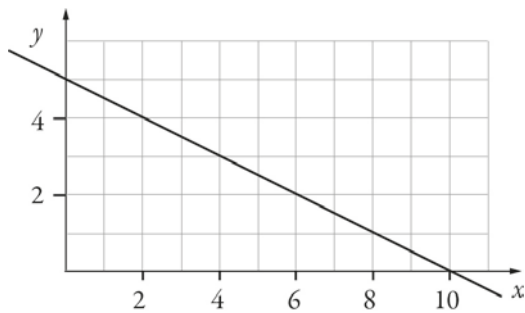
4. Solve the equation  $4x^3 = 32$  Answer:  $x =$  \_\_\_\_\_ (1/0/0)

5. The carbon dioxide concentration of air is 393 ppm.  
Write this concentration as a decimal. Answer: \_\_\_\_\_ (1/0/0)

6. The number 113 is written in base 7. Write the number in base 10. Show your solution.

Answer: \_\_\_\_\_ (0/2/0)

7. The figure below shows the graph of the function  $y = f(x)$ .



- a) Use the graph to determine  $f(2)$ . Answer:  $f(2) =$  \_\_\_\_\_ (0/1/0)
- b) Use the graph to solve the equation  $f(x) = 2$ . Answer:  $x =$  \_\_\_\_\_ (0/1/0)

8.  $A = \frac{B}{B+1}$  where  $B$  is a positive number.

Will  $A$  be greater or smaller if  $B$  is doubled?  
Motivate your answer.

Answer: \_\_\_\_\_ (1/1/1)

9. Solve the equation  $\frac{3x+1}{4} - \frac{2x+3}{3} = 2$

Show your solution.

Answer:  $x =$  \_\_\_\_\_ (0/2/0)

10. What expression(s) are greater than 2 per mille?  
Circle your answer(s).

$$\frac{2}{2\ 000}$$

$$0.00201$$

$$\frac{1}{499}$$

$$\frac{1}{501}$$

$$1.9 \times 10^{-3}$$

(0/1/1)

11. Confidential task. Will be added/included as soon as confidentiality has expired.

12. Which number should be in the empty box in the table?

$x$	$xy$	$xy^2$
2	-10	

Answer:  $xy^2 =$  \_\_\_\_\_ (0/0/1)

13. An icicle has the volume  $V(t)$  cm<sup>3</sup> where  $t$  is the time in minutes after 08:00. At 09:00 the icicle has the volume 21 cm<sup>3</sup>. Use the function  $V(t)$  and write this statement using mathematical symbols.



Answer: \_\_\_\_\_ (0/0/1)



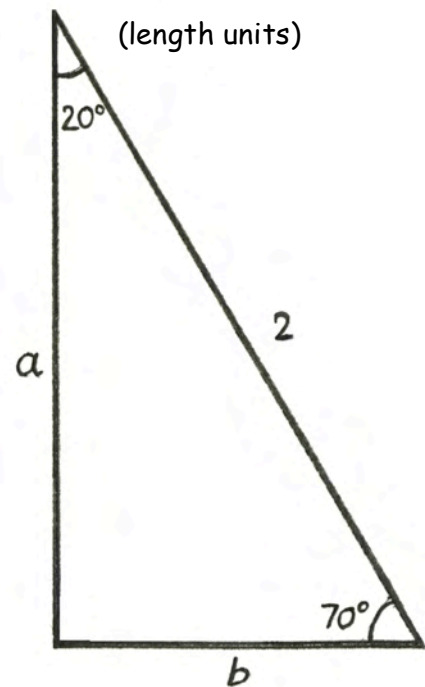
14. Write  $\sqrt{a^6} \times \sqrt{a^6}$  as a power with the base  $a$ . Answer: \_\_\_\_\_ (0/0/1)

15. Determine the length of side  $a$  in the triangle with the help of the table.

The figure is not drawn to scale.

Answer: \_\_\_\_\_ length units (0/0/1)

Degrees	Sin	Cos	Tan
0	0.000	1.000	0.000
5	0.087	0.996	0.087
10	0.174	0.985	0.176
15	0.259	0.966	0.268
20	0.342	0.940	0.364
25	0.423	0.906	0.466
30	0.500	0.866	0.577
35	0.574	0.819	0.700
40	0.643	0.766	0.839
45	0.707	0.707	1.000
50	0.766	0.643	1.192
55	0.819	0.574	1.428
60	0.866	0.500	1.732
65	0.906	0.423	2.145
70	0.940	0.342	2.747
75	0.966	0.259	3.732
80	0.985	0.174	5.671
85	0.996	0.087	11.430
90	1.000	0.000	



16. Determine  $n$  if  $2^4 \times 3^8 = 9^n \times 6^4$  Answer:  $n =$  \_\_\_\_\_ (0/0/2)

# Compilation of student results

National test in mathematics 1c, autumn 2016

Name:	Test grade:
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	E-points		C-points		A-points		Total	
	Your score	Maximum score	Your score	Maximum score	Your score	Maximum score	Your score	Maximum score
<b>Part A</b>		3		4		4		11
<b>Part B</b>		7		8		9		24
<b>Part C</b>		3		5		3		11
<b>Part D</b>		13		16		8		37
<b>Total</b>		<b>26</b>		<b>33</b>		<b>24</b>		<b>83</b>

Part A	E	C	A	Score	Comment
Method and carrying through	+E	+C	+A		
Presentation	+E +E	+C +C +C	+A +A +A		
Total	3	4	4		

Part C	E	C	A	Score	Comment
Method and carrying through	+E +E +E	+C +C +C	+A		
Presentation		+C +C	+A +A		
Total	3	5	3		

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## Test grade

The test grade sums up the knowledge that the student has shown on the national test. The course grade does not have to be the same as the test grade since the course grade is based on all the knowledge that the student has shown during the course.

Comments:
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