

Admission Test Mathematics

for Art of Sound

EXAMPLE

Name:

formal education

Mathematics as subject? yes / no

This is an example of the admission test Mathematics for Art of Sound and Sonology. The real test looks very much like this one.

The examination is meant to test the most elementary knowledge of mathematics

The level of the test is far below the level that is required to pass the first year of art of sound or sonology with success. The aim of this test is to separate those whose knowledge of mathematics is fully insufficient from those who should be able to reach the required level.

The test consists of two parts. In part A you only write down the final answer, in the box directly behind the question itself. If necessary you can write your calculations on a separate paper.

In part B you have to write down not only the final answer, but all calculations and explanations as well. You make part B on a separate paper.

You may use a normal calculator (NOT a graphic calculator!)

When you do the real test, admission (or not) is based on the results for the first part.

The first and the second part together determine whether you get an exemption for the first math exam in September. You get an exemption if your grade for this admission test is 7.0 or higher.

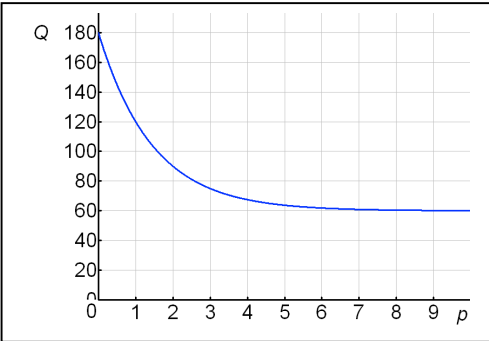
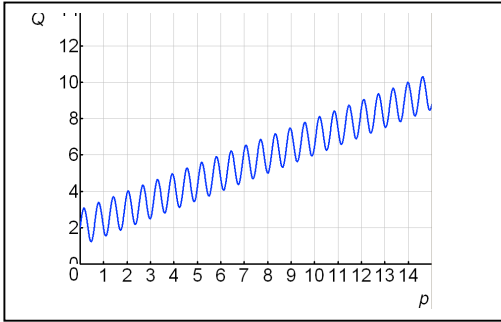
If you get this exemption, the grade you got for the admission test (part 1 and 2) will be your first grade for Math. If you don't get the exemption, you will have to do the first test in September. This test looks exactly like the admission test and is about the same subjects.

Part 1 Only final answers

Write your calculations on a separate paper and write down your final answer in the right column.

Algebraic rules	Final answer (no calculations!)
Write as short and simple as possible (without brackets).	
1 $-5xy \cdot -z \cdot -2y =$	
2 $3x - -8x - + 4x =$	
3 $2x + 7x \cdot 3 - 2^2 \cdot x =$	
4 $7x(4x - 5) =$	
5 $(-x + 1)(5 + 4x) =$	
6 $(8x - 2)^2 =$	
7 $x^4 \cdot x^3 =$	
8 $\frac{x^6}{x^4} =$	
9 $(x^4)^6 =$	
10 $(-7x^5)^2 =$	
11 Substitute $x = -2$ in: $4 - 3x + 2x^2 - (-3x + 10)$	

Converting units	Final answer (no calculations!)
12 Write without powers of 10: $5,73 \cdot 10^{-4}$	
13 Write in scientific notation: 63000	
14 Convert. 45 cm = hm	
15 Convert. 0,25 cg = mg	
16 Convert. $200 \text{ cm}^2 = \text{.....m}^2$.	

Graphs	Final answer (no calculations!)
<p>The graph shows Q as a function of p.</p>  <p>17 What value has Q for $p = 1$?</p>	
<p>18 This question is about the graph of problem 17. For which value of p does Q equal to 80?</p>	
<p>19 This question is about the graph of problem 17. What value of Q do you expect at $p = 20$?</p>	
<p>The signal in the graph will follow the same pattern until p becomes 100.</p>  <p>20 At which value of p (approximately) the lowest point of the wave will be higher than 12?</p>	
<p>21 This question is about the graph of problem 20. Give an approximation of the minimum value of Q that is reached in the graph.</p>	

linear functions and equations	Final answer (no calculations!)
<p>22 Solve: $6x + 1 = 2 - 4x$</p>	
<p>23 Compute the formula of the straight line through $A(-1, 2)$ and $B(3, 10)$.</p>	
<p>24 Give the formula of the vertical line through $A(2, 3)$ en $B(2, 8)$.</p>	
<p>25 Compute the coordinates of the intersection point of the line $y = 10x - 4$ with the horizontal axis.</p>	
<p>26 The quantities A and B are proportional according to the formula: $A = 32B$. What happens to B when A becomes twice as small?</p>	

Second degree functions	Final answer (no calculations!)
27 Write $10x^2 + 30x$ as a multiplication (use factoring)	
28 Write $x^2 - x - 6$ as a multiplication (use factoring)	
29 Solve: $(x - 2)(4x + 20) = 0$	
30 Solve: $x^2 - 13x + 30 = 0$	
31 Solve: $2x^2 - 1 = x$	
Using formulas	
32 Ohm's law is known as $U = R \cdot I$ Compute I when $U = 250$ and $R = 120$.	
33 In Ohm's law (see 32) is $R = 30,2L$ Express U in I and L .	
34 In $Q = 4 \cdot \frac{p \cdot t}{a}$, $p = 2 \cdot 10^3$, $t = 5 \cdot 10^8$ and $a = 5 \cdot 10^4$. Compute Q	
35 In the formula $E = 0,5 mv^2$, $E = 10$ and $m = 6$. Compute v .	

Part 2 More complex questions

→ All answers have to be explained by calculations..

- Write as short and simple as possible:
 - $-3x + 1 + x^2 + 2x - 4x^2 + 5 =$
 - $-4^2 - (-3x)^4 =$
 - $8p + 2p \cdot (2 \cdot 5 - 3) =$
- Convert and write the answer in scientific notation: $150 \cdot 10^{-2} \mu\text{m} = \dots \text{cm}$
- Determine domain and range of $f(x) = -x^2 + 8$
- Determine domain and range of $f(x) = \frac{3}{x-4}$
- Solve: $4(2x-1) - 3x = 2(1-5x) + 1$.
- Give a formula for the horizontal line trough $A(8, 2)$ en $C(-2, 2)$.
- Give a formula for the straight line trough $P(2, -4)$, parallel to $y = -3x - 7$.
- Compute the coordinates of the intersection point of the lines $y = 5x + 2$ en $y = 3x + 12$.
- Compute the coordinates of the intersection point of $y = x^2 - 1$ en $y = x - 2x^2$.
- Solve: $(x+1)^2 = 6 - x$

Answers

1	$-10xy^2z$
2	$7x$
3	$19x$
4	$28x^2 - 35x$
5	$-4x^2 - x + 5$
6	$64x^2 - 32x + 4$
7	x^7
8	x^2
9	x^{24}
10	$49x^{10}$
11	2
12	0.000573
13	$6.3 \cdot 10^4$
14	0.0045
15	2.5
16	0.02
17	120
18	2.4
19	60
20	22
21	1.2
22	0.1
23	$y = 2x + 4$
24	$x = 2$
25	(0.4 ; 0)
26	B becomes twice as small as well
27	$10x(x + 3)$
28	$(x - 3)(x + 2)$
29	$x = 2$ or $x = -5$
30	$x = 3$ or $x = 10$
31	$x = 1$ or $x = -0.5$
32	2.083
33	$U = 30.2 \cdot LI$
34	0.000 000 8
35	1.83

Part 2 More complex questions

- | | | | | |
|---|--|------------------|----|---|
| 1 | a | $-3x^2 - x + 6$ | 5 | $7/15$ |
| | b | $-16 - 81x^4$ | 6 | $y = 2$ |
| | c | $22p$ | 7 | $y = -3x + 2$ |
| 2 | | $1.5 \cdot 10^4$ | 8 | (5, 27) |
| 3 | $D_f = \mathbf{R}; B_f = \langle \leftarrow, 8 \rangle]$ | | 9 | $\frac{1}{6} \pm \frac{1}{6}\sqrt{13}$ |
| 4 | $D_f = \mathbf{R} \setminus \{4\}; B_f = \mathbf{R} \setminus \{0\}$ | | 10 | $-\frac{3}{2} \pm \frac{1}{2}\sqrt{29}$ |