

## Instructions – Part I

<b>Time</b>	90 minutes for Part I. It is recommended that you use a maximum of 45 minutes for working with the part where calculator is not allowed. You may not use your calculator until you have submitted your answers to this part.
<b>Aids</b>	<b>Part where calculator is not allowed:</b> Approved formula page and ruler. <b>Question 14:</b> Calculator, approved formula page and ruler.
<b>The part without calculator</b>	This part consists of questions to be solved without a calculator. Two of the questions require that you explain your solution. Present your solutions in the figure and the box nearby the question. The rest of the questions require only the answer. After each question the maximum number of points available for your answer/solution is shown.
<b>Question 14</b>	This question is a larger question, which normally requires more time. In the box below the question you can see what considerations the teacher will make in assessing your solution.
<b>Grading</b>	The test (part I + part II) gives a total maximum of 61 points, of which 28 are vg-points. <i>Lower limits for examination grade</i> Pass: 20 points Pass with distinction: 36 points of which at least 10 vg-points Pass with special distinction: At least 20 vg-points. In addition you must demonstrate several of the MVG-qualities that are possible to show in the questions marked ■.

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

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

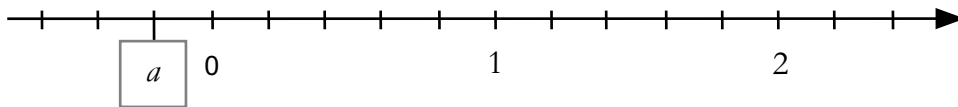
Adult education/Secondary school program: \_\_\_\_\_

Name:..... Class/Group:.....

## Part I

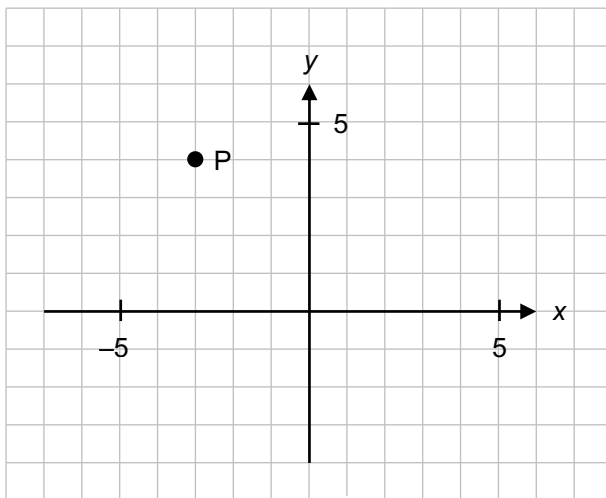
1. What number is 0.1 greater than 3.96? Answer: \_\_\_\_\_ (1/0)

2. What number, in decimal form, should be in the square?



Answer:  $a =$  \_\_\_\_\_ (1/0)

3. What coordinates does the point P have?



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

4. Julia makes a copy of her drawing using the school's photocopier. A face which is 12 cm long on her drawing is 4 cm long on the copy. In what scale does Julia do her copying?

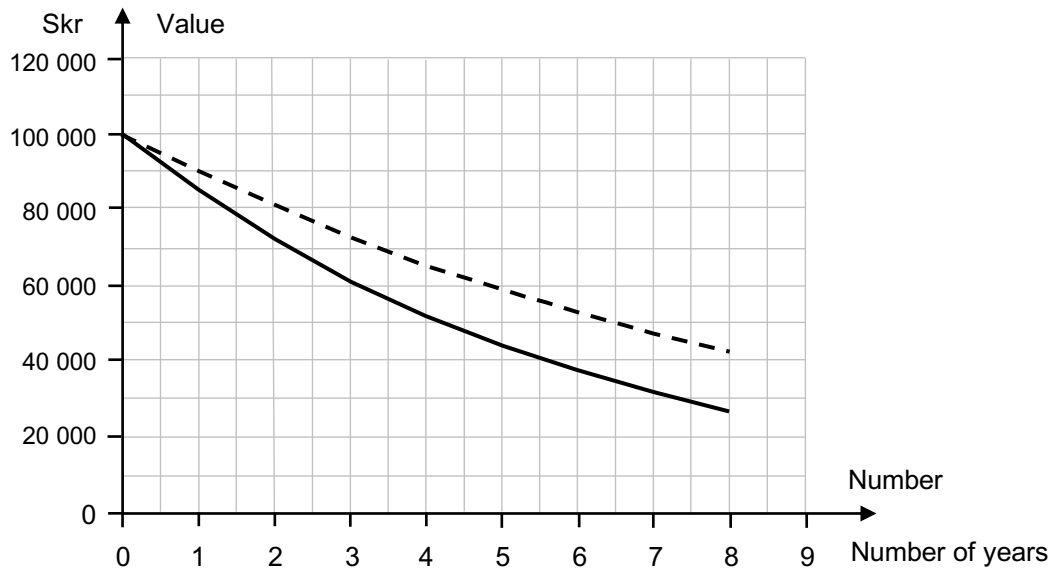
Answer: \_\_\_\_\_ (1/0)

5. What is the *approximate* value of ?  
Circle your answer.

(1/0)

3                      30                      60                      300                      440

6. Sarah buys a used car for 100 000 Skr. The value of the car will decrease. In the diagram you can see how the value will change if it decreases by 10 % or 15 % per year respectively.



- a) What will the value of the car be after three years if the annual percentage decrease is 10 %?

Answer: \_\_\_\_\_ Skr

(1/0)

- b) How much longer does it take for the value to be halved if the percentage decrease is 10 % rather than 15 % per year? Explain your solution using the diagram and the answer box below.

Answer: \_\_\_\_\_ years

(1/1)

7. Which of the following expressions gives the perimeter of the figure?  
Circle your answer.

$a + b$

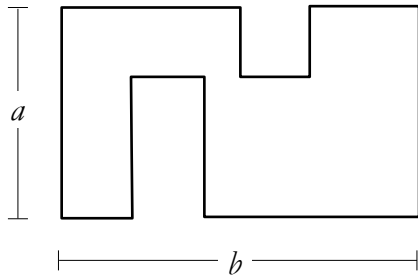
$2a + 2b$

$3a + 2b$

$3a + 3b$

$4a + 2b$

Explain how you got your answer using the figure and the box below.



(1/1)

8. Sanna is to take 15 ml of her medicine twice every day. How long will her bottle of medicine last if it contains 0.3 litres?

Answer: \_\_\_\_\_ days

(0/1)

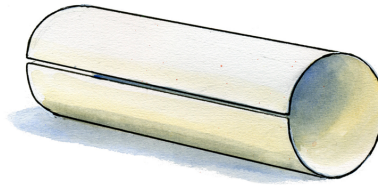
9. \_\_\_\_\_ of a certain number is 1. What is the number? Answer: \_\_\_\_\_

(0/1)

10. Solve the equation Answer:  $x =$  \_\_\_\_\_ (0/1)
11. Petter weighs  $p$  kg and Simon weighs  $s$  kg.  
Write a formula which expresses that Petter weighs 12 % more than Simon. Answer: \_\_\_\_\_ = \_\_\_\_\_ (0/1)
12. In a rectangle the long side is 4 cm longer than the short side. What expression gives the length of the short side if the length of the long side is written as  $x + 2$  ? Answer: \_\_\_\_\_ (0/1)
13. The number \_\_\_\_\_ is written in scientific form. What number must you subtract so that the digit "eight" will be changed to a "six"? Answer in decimal form. Answer: \_\_\_\_\_ (0/1)

## Question 14 – A roll of paper

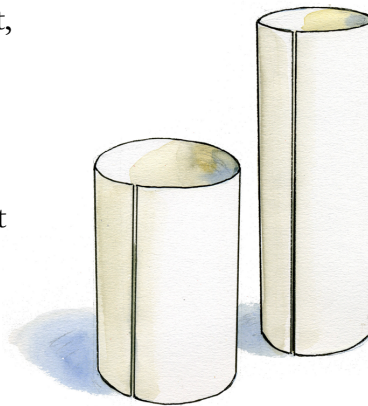
A rectangular sheet of paper can be rolled to make a tube (cylinder) as shown in the figure.



Such a tube is made by rolling a square piece of paper with side length 10 cm.

- The diameter of the tube will be about 3.2 cm. Find the volume of this tube (cylinder).
- Show that the diameter of the tube will be about 3.2 cm if the side length of the sheet of paper used is 10 cm.

If the length and width of the paper are different, you can make two different tubes (cylinders) depending on how you roll the paper.



- Starting with rectangular sheets of paper with dimensions 10 cm x 20 cm, two different tubes are made. Find the volumes of the two tubes (cylinders).
- Compare these two volumes and calculate the ratio between them.
- Investigate the ratio between the cylinder volumes using sheets of paper with other dimensions. What affects the volume ratio between the tall and the short cylinder?
- Show that your conclusion is true for all rectangular papers.

(4/7) ■

### **In assessing your work the teacher will take into consideration**

- what mathematical knowledge you have shown and how well you have carried out the task
- how well you have explained your work and defended your conclusions
- how well you have presented your solution.