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**National Test in
MATHEMATICS
COURSE A**

Spring 2009

Part I

Instructions

Time 90 minutes for Part I. It is recommended that you use a maximum of 40 minutes for working with the short answer questions. You may not use your calculator until you have submitted your answers to the short answer questions.

Aids **Short answer part:** Approved formula page and ruler.
Question 15: Calculator, approved formula page and ruler.

Short answer part This part consists of questions to be solved *without a calculator*. *Only the answer are required*. A correct answer gives 1 g-point (1/0) or 1 vg-point (0/1).

Question 15 This question is a larger question which normally requires more time. In the grey box below the question you can see what considerations the teacher will make in assessing your solution.

Grading The test (Part I + Part II) gives a total maximum off 61 points, of which 28 are vg-points.

Lower limits for examination grade

Pass: 19 points

Pass with distinction: 35 points of which at least 12 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 ■.

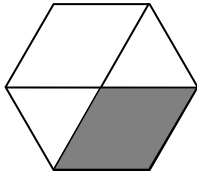
Name: _____ Date of birth: _____

Adult education/Secondary school program: _____

Name: Class/Group:

Part I

1. How large part of the figure is shaded?



Answer: _____ (1/0)

2. Calculate $13 - 25 + 7$

Answer: _____ (1/0)

3. Every year two teams from different universities compete in rowing. Each team consists of a steersman and a number of oarsmen. The histogram shows the distribution of the weights of the team members one year.

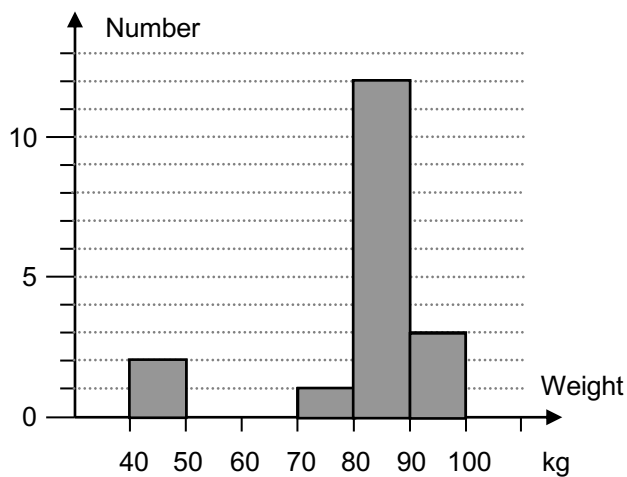


Foto: Odd Andersen/AFP/Scanpix

- a) How many people were there altogether in the two boats?
- b) A steersman should not weigh too much since he only steers the boat. About how much does a steersman weigh?

Answer: _____ st (1/0)

Answer: _____ kg (1/0)

4. Which of the following numbers have the value 0.6? Circle your answer.

$\frac{1}{6}$

$\frac{2}{5}$

$\frac{4}{6}$

$\frac{3}{5}$

$\frac{1}{2}$

(1/0)

5. A car travels 11 km in 10 minutes. Calculate the average speed of the car in km/h.

Answer: _____ km/h

(1/0)

6. The average length for a certain kind of bacteria is 0.000000313 m. What number should x be if we want to write this length in scientific notation as $(3.13 \cdot 10^x)$?

Answer: $x =$ _____

(1/0)

7. You can think of a function as a "Black box". If you put in a number, x , out comes another number, y .

$$x \longrightarrow \boxed{6 \cdot x - 4} \longrightarrow y$$

- a) What number comes out if you put in the number "two thirds"?

Answer: $y =$ _____

(1/0)

- b) What number have you put in if the number 50 comes out?

Answer: $x =$ _____

(0/1)

8. Anna is going to put her spices into little bags. In each bag there is to be 25 g. How many little bags will there be if she has 2 kg of spices?

Answer: _____ st

(0/1)

9. Which expression is equal to one quarter of a ? Circle your answer.

(0/1)

$a - \frac{1}{4}$

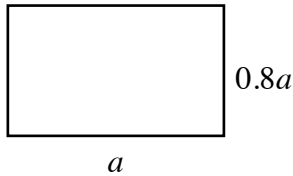
$\frac{4}{a}$

$\frac{1}{4a}$

$0,25a$

$\frac{a}{0,25}$

10. By what percentage is the length of the short side less than the length of the long side in this rectangle?



Answer: _____ % (0/1)

11. One edge of a cube has length $2a$. Write an expression for the volume of the cube.

Answer: _____ (0/1)

12. One base angle in an isosceles triangle is four times as big as the top angle. How big is the top angle?

Answer: _____ degrees (0/1)

13. n is an integer. Which of the following expressions always gives a value that is an odd number? Circle your answer.

(0/1)

$n + 1$

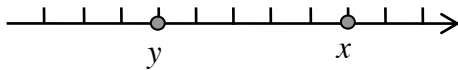
$2n + 1$

$n + 2$

$2(n + 1)$

$n + 3$

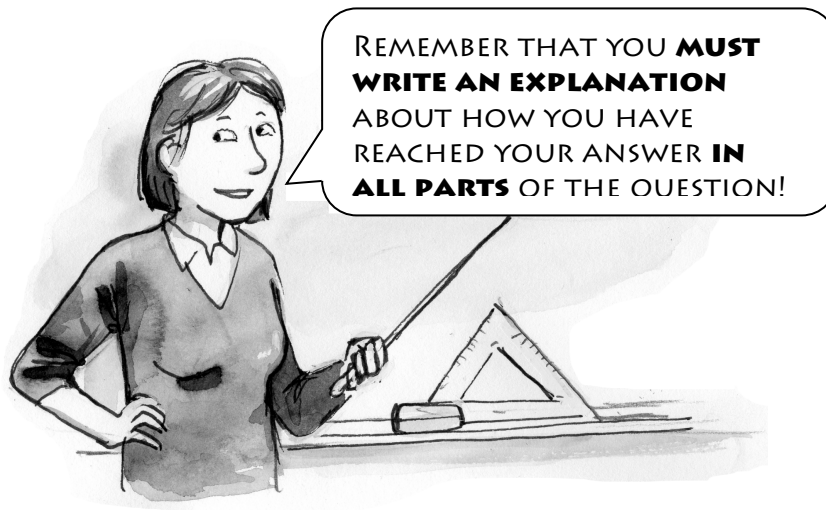
14. On the number line the numbers $x = 2$ and $y = -\frac{1}{2}$ are marked.



Mark the number $x - y$ on the number line with the symbol X.

(0/1)

Question 15 – Mean and median for four numbers



- I** You have four given numbers. They are 1, 9, 2 and 4.
- The mean for these four numbers is 4. Show that this is correct.
 - The median for the four numbers is 3. Show that this is correct too.
- II** The mean for four numbers is 9. Three of the numbers are 4, 11 and 16.
- What is the fourth number?
- III** The median for four numbers is 10. Three of the numbers are 8, 3 and 12.
- What values might the fourth number have?
- IV** The mean for four number is 6. Two of the numbers are 4 and 7.
We represent the other two numbers as a and b .
- Give three different suggestions for the numbers a and b .
 - Describe the relationship between the numbers a and b using words or a formula.
- V** The median for four numbers is 7. Two of the numbers are 5 and 10.
We represent the other two numbers as c and d , where d is greater than or equal to c . Investigate what the numbers might be.
- Give three different suggestions for the numbers c and d .
 - Explain what the greatest possible value for d can be.

(5/5)

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.