

SUBJECT TEST

# Mathematics

GRADE

9

Spring  
2008

Secrecy until 2008-06-30

Version 1

## Part B2

Aids: Access to calculator

Name

## Part B2

The contents of this test paper must remain *confidential* until June 30, 2008.

This part consists of questions you may work with for about 50 minutes.

It is very important that you carefully explain the reasoning in your solution.

In the box below the question you can see what considerations the teacher will apply in assessing your work. At the most the question can yield 4 g-points and 5 vg-points. The symbol  $\alpha$  indicates that you may demonstrate MVG-qualities in your solution.

Aids: Access to calculator.

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

School: \_\_\_\_\_ Class: \_\_\_\_\_

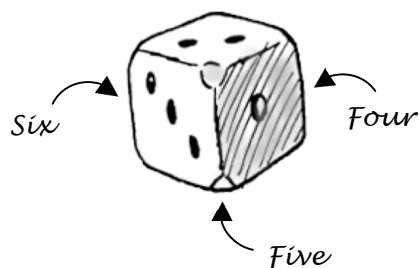
Birth date: Year \_\_\_\_ Month \_\_\_\_ Day \_\_\_\_

Female  Male

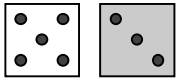
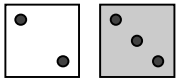
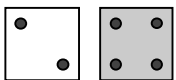
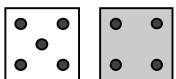
*Solutions and answers must be written on separate paper, not on this question paper. The question paper must be handed in, together with your solution.*

## Playing Dice

On an ordinary 6-sided die the side with the 1 is always opposite the 6, the 2 is opposite the 5 and the 3 is opposite the 4.



Hanna rolls one white and one grey die. She multiplies the number of dots that come up on the two dice together (see step 1 in the table). Then she turns each die upside down, one at a time, and makes the calculations indicated in the table below.

Step no			Product
1		Here you see what Hanna's dice showed at first.	$5 \cdot 3 = 15$
2		Here Hanna has turned the white die upside down so that <i>the opposite side</i> comes up.	$2 \cdot 3 = 6$
3		Here Hanna has turned the grey die upside down so that <i>the opposite side</i> comes up.	$2 \cdot 4 = 8$
4		Here Hanna has turned the white die back to its original position.	$5 \cdot 4 = 20$
5		Finally Hanna calculates the sum of the products.	$15 + 6 + 8 + 20 = 49$

- I Choose yourself what the dice show at the start. Follow the same steps as in the table above. What sum do you get?
- II What conclusion can you make? Show that your conclusion is correct no matter what the dice show at the start.
- III On an 8-sided die the 1 is always opposite the 8, the 2 is opposite the 7 etc. Make a similar investigation for two 8-sided dice as you did for the 6-sided dice. What conclusion can you make?
- IV What will be the sum of the products if you use 12-sided or 20-sided dice? Describe the relationship between the number of sides on the dice and the sum of the products. You may use words and/or formulas.

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

- what mathematical knowledge you have shown
- what conclusions you have made
- how well you have presented your work and carried out your calculations.

