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National Test in MATHEMATICS COURSE A

Autumn 2009

Part I

Instructions

Time	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.
Aids	Part where calculator is not allowed: Approved formula page and ruler. Question 15: Calculator, approved formula page and ruler.
The part without calculator	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.
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 of 60 points, of which 26 are vg-points. <i>Lower limits for examination grade</i> Pass: 20 points Pass with distinction: 34 points of which at least 10 vg-points Pass with special distinction: At least 19 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. Write 17 thousandths in decimal form. Answer:_____ (1/0)

2. A TV normally costs 15 000 kr but is sold at a discount of 30 %. How many kr is the discount? Answer:_____kr (1/0)

3. The braking distance for a car on a dry asphalt pavement is about 20 m at a speed of 60 km/h. For what speed is the braking distance doubled?

Answer:_____km/h (1/0)

4. Find the value of $25 - 3x$ if $x = -2$ Answer:_____ (1/0)

5. Calculate $2 \cdot 10^4 + 5 \cdot 10^3$ Answer:_____ (1/0)

6. It is given that $29.2 \cdot 1.3 = 37.96$.
Find the value of $292 \cdot 0.13$?

Answer: _____ (1/0)

7. Suppose that the interest on a bank loan increases from 4 % to 5 %.

a) How many percentage points did the interest increase?

Answer: _____ percentage points (1/0)

b) What was the percentage increase for the interest?

Answer: _____ % (0/1)

8. About how big is the area of the triangle? Circle your answer.

1 cm²

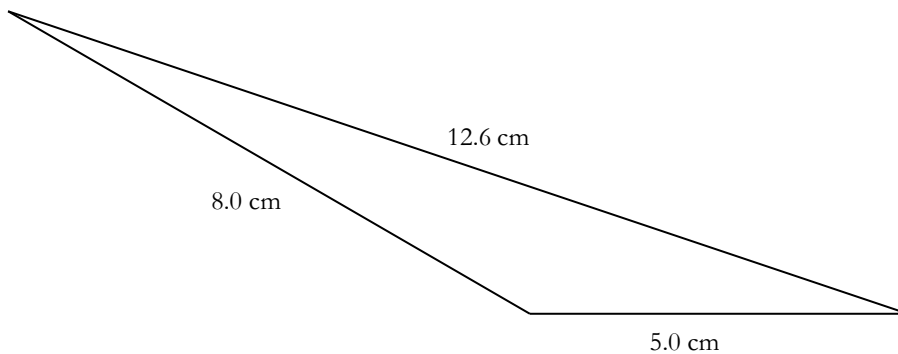
5 cm²

10 cm²

20 cm²

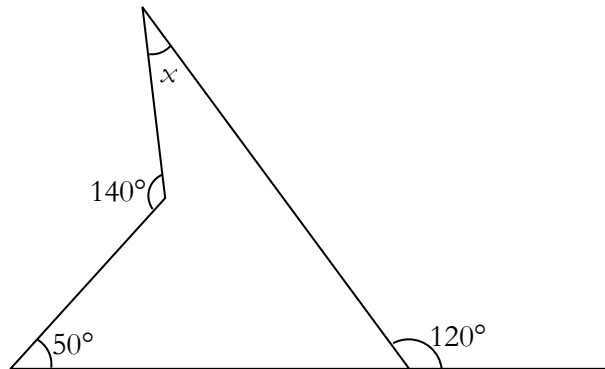
26 cm²

Explain your answer in the figure and in the box.



(1/1)

9. Find the angle x in the figure. Explain your solution and answer in the figure and box.



Answer: _____ degrees

(1/1)

10. What number should be written in the box in order for the equality to be true?

$$\frac{2}{3} + \boxed{} + \frac{1}{9} = 1$$

Answer: _____

(0/1)

11. The table shows the relationship between x and y .

x	1	2	4	6	8
y	5	7	11	15	19

Circle the formula that shows the relationship between x and y .

$y = 5x$
 $y = 6 - x$
 $y = 6x - 1$
 $y = x^2 + 4$
 $y = 2x + 3$
 (0/1)

12. A cube has volume 27 cm^3 .
Find the area of one side.

Answer: _____ cm^2 (0/1)

13. $a - 3$ is an odd integer. State an expression
for the next larger odd integer.

Answer: _____ (0/1)

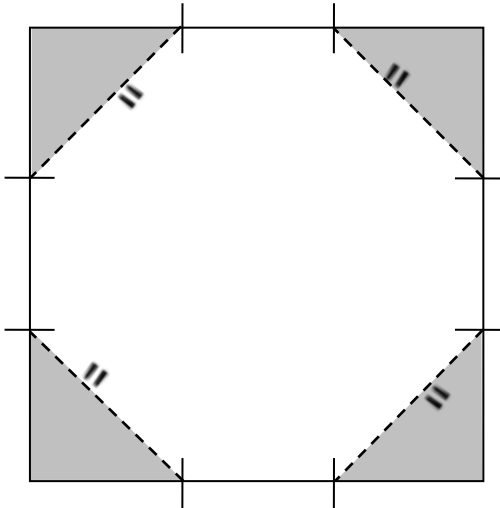
14. What number is missing in the empty box in the table?

$\frac{x}{2}$	$\frac{x}{3}$
6	

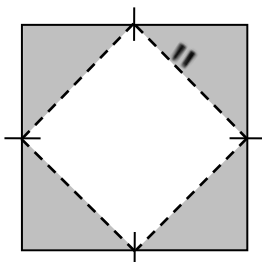
Answer: $\frac{x}{3} =$ _____ (0/1)

Question 15 – Cutting out squares

Each side of the square is divided into three *equal parts*. The corners are then cut off (see figure).



- What proportion (part) of the area of the square is cut off?
- Each side of another square is divided into two *equal parts*. The corners are then cut off (see figure). What proportion of the square is cut off?



- Investigate what proportion of the area of the square is cut off if you divide the side of the square into four, five or more *equal parts*.
- Write a formula that expresses what proportion of the area of the square is cut off if the sides of the square are divided into n *equal parts*.
- Show that your formula is correct.

(5/4) ■

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.